RESEARCH BULLETIN 1086 MAY 1976

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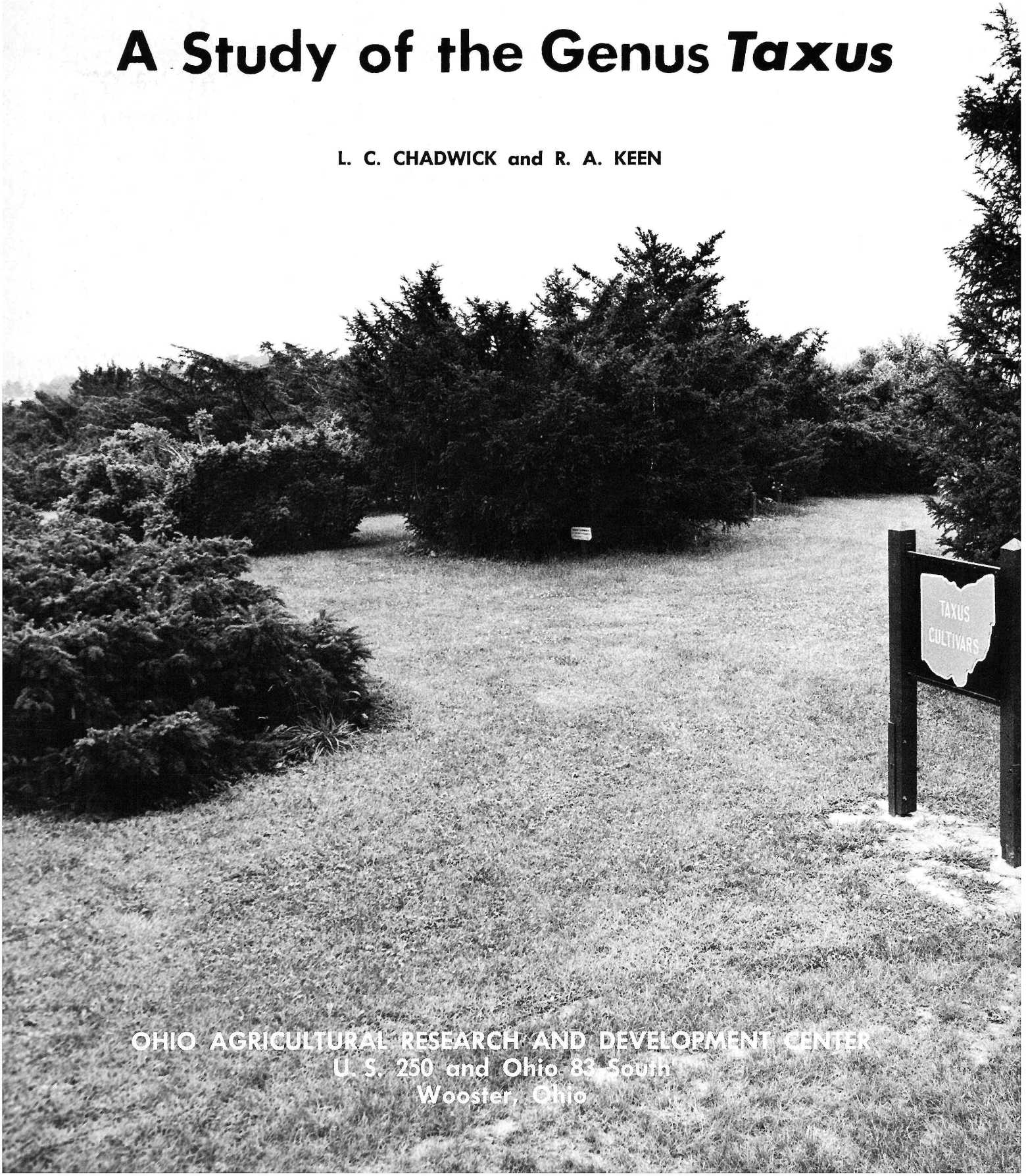

OHIO AGRICULTURAL RESEARCH AND DEVELOPMENT CENTER
U. S. 250 and Ohio 83 South
Wooster, Ohio

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ACKNOWLEDGMENTS

The authors acknowledge the encouragement and assistance of their colleagues during the period of this study, particularly Oliver D. Diller, John E. Ford, and the late Harry Muckley, who supervised the maintenance of the plantings in the Secrest Arboretum.

AGDEX 276/06-21-33 5-76-5M

A Study of the Genus *Taxus*

L. C. CHADWICK and R. A. KEEN[1]

INTRODUCTION

In American gardens, the Yews have always been associated with quality. Their foreign origin, moderate growth rate, and limited supply restricted their use to the estates of the wealthy. The few mature specimens in America today are to be found in the antebellum plantation gardens and cemeteries of the South, and on the grounds of the rapidly disappearing estates on Long Island and near Boston and other large cities on the Eastern Seaboard.

With the adoption of Quarantine 37 in 1918 which prevented the importation of nursery stock, the nurserymen of America were forced to start propagating evergreens. In order to meet the demand of the public for quality evergreens, the Yews were propagated from almost any available source. Cuttings were taken from local estates, park plantings, and nursery plants. Seed was collected from mixed plantings anywhere. The resulting plants were usually salable, although they were well described as "mongrels". The less scrupulous nurserymen would supply a name, or worse, market the plants to a gullible public under some name which had current demand. The confusion of names resulting from such practices presented taxonomic difficulties of the genus which still exist today.

The cultivars of the English Yew have been produced over a period of centuries. Their introduction, evaluation, and description have been slow and more or less orderly because of the time involved and the single species as a source.

By contrast, the Japanese Yew was brought to America a little more than a century ago (1862) and *Taxus media* was introduced about 1920. Since then many cultivars of these two species have found their way into the trade, often with few records kept as to origin and without a clearly defined description of the introduction.

PURPOSE OF THIS STUDY

The Living Herbarium of Taxus, a part of the Secrest Arboretum at the Ohio Agricultural Research and Development Center, Wooster, was established jointly by the Ohio Nurserymen's Association and the Ohio Agricultural Experiment Station (now the Ohio Agricultural Research and Development Center) in 1942 for the purpose of studying the taxonomy of this genus and to classify, name, and describe the Yews in the American horticultural trade as far as practicable.

The first plants were received and planted in May 1942. These plants were planted in groups of mostly five of a kind, from a single source if possible. The sizes were 15-18 inches, 18-24 inches, or 24-30 inches in height or spread, whichever was greater. The rows were 12 feet apart and distance between plants in each row was 10 feet. Additional plants and replacements, where needed, were planted each season as received.

The present planting includes 97 accessions. Many of the "named" accessions in the collection at one time or another during the past 34 years have been found to be synonymous with previously named cultivars. Others have died due to unfavorable cultural conditions, or have been removed due to severe winter injury. Some 141 accessions have been received.

EARLY HISTORY OF YEWS

The earliest Greek and Roman authors mentioned the Yew in connection with its quality as a wood for bows and its effectiveness as a poison, according to Coltman-Rogers (11). Loudon (28) pointed out that Theophrastus considered the leaves poisonous to horses and that Caesar told of a king who poisoned himself with the juice of the Yew. Yew poisoning continues to be a problem, especially in cattle (7). Yet Canadian Yew in its natural habitat and other Yews in nurseries are a preferred browse for deer in winter.

Loudon (29) derived the name Yew "from the Celtic word *Iw,* sometimes pronounced *if,* and signifying verdure, alluding to the Yew as being evergreen." He was unable to determine whether the name Taxus was derived from *taxon,* a bow; *taxis,* the arrangement of the leaves like the teeth of a comb; or the Greek word for poison, *toxicum.* Coltman-Rogers (11) took the opposite view that "The Greek word toxon (a bow) was evolved from another Greek word, *taxos* (a yew) . . ."

The name Taxus was first proposed for the genus by Tournefort in 1717, and adopted by Linnaeus (27) in 1753 in his *Species Plantarum.*

According to Hooker (21), the genus received little attention until the early part of the nineteenth century. The first mention of cultivars of the English Yew was in 1686 by Plot, who described a golden Yew which occurred in the county of Staffordshire, England, according to Elwes and Henry (16). Leighton

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(1) described the Dovaston English Yew (*dovastoniana)* in his *Flora of Shropshire* in 1841.

Carriere (8) and Gordon (18) described most of the distinct varieties in England and on the continent prior to 1900. Since then, Beissner (6), Dallimore (12), Bean (5), and Gibbs (17) have added to the growing list of cultivars, with Hornibrook (23), Den Ouden (13), Krussmann (26), Den Ouden and Boom (14), and Keen (25) listing additional cultivars to the present time.

In America, Hoopes (22) had a fairly complete list in 1868. He was unaware of the introduction of *T. cuspidata* 6 years earlier in Rhode Island by R. Hall. Rehder described many of the new cultivars and clones in Bailey (3, 4) and the *Journal of Arnold Arboretum.*

Following the development and introduction of the hybrid *T. media* and *T. hunnewelliana* lines by Hatfield (19), the catalogs and trade papers have mentioned well over 100 new named selections of Yews.

THE HATFIELD YEWS

Much of the popularity of Yews is due, at least in the early years, to the work of T. D. Hatfield, head gardener at the Hunnewell estate, Wellesley, Mass. In addition to raising the first recognized hybrids and distributing them widely, he wrote popular articles (19) and lectured on their merits (20). As early as 1866, the Hunnewell estate received some of the first *T. cuspidata* and *T. cuspidata nana* plants (called *"T. brevifolia"* at that time) released by the Parsons Nursery from Dr. Hall and also imported directly from Japan. Additional plants were received from the Arnold Arboretum from seed collected by C. S. Sargent in Japan before Hatfield came to America. Hatfield found a *"T. baccata sieboldii"* at Waterer's Nursery in England which he imported to the Hunnewell estate. This was reported to be from China, but he recognized that it definitely was not *T. chinensis,* but probably *T. cuspidata,* from its winter hardiness.

C. S. Sargent had observed that Hatfield "seemed to have a nurseryman's instinct for propagating plants" because he was always propagating the rare and unusual plants on the estate. These young plants were often presented to friends of his employer, both here and abroad. Surplus plants and seed were also sold to nurseries.

Hatfield's names (19) indicate that he did not recognize the hybrid character of his early seedlings of the Irish, Dovaston, and Canadian Yews. His "Second Irish," "English," "Dovastoni upright," "canadensis stricta," "upright brevifolia," and "irregular brevifolia" were as descriptive as they were apt. A photographic copy of this Hatfield early record is in the authors' file material.

These seedlings were put in a test plot in an exposed area where only the more tender of the "plants of English and Irish blood" were injured during 10 winters, ". . . but finally there came a winter which made a distinction between the English and Japanese types more decided than any botanist could." About 10 percent were uninjured; "the other 90 percent were sent to T. A. Havemeyer of Long Island where they enjoy a more salubrious climate, . . ." and from here some found their way into the nursery trade. Of those retained, one of the best "English" plants was selected as the type plant for the hybrid genus *T. media* by Rehder (31), and the best of the "Irish" he named *T. media hatfieldii* after Hatfield. Others in this group were assigned names by Hatfield in honor of his friends: *Brownii* for R. T. Brown, *Sewellii* after the family physician, and *Wellesleyana* after the village. One of his *"upright brevifolia"* seedlings of *T. cuspidata nana* with a propensity for twin fruits, furnished Mr. Brown of Cottage Gardens, Queens, L. I., was named *Wardi* in honor of Brown's employer. Its merits were likewise recognized in material furnished Harry Deverman, who called it *"Cliftoni"* after the New Jersey location of his nursery. Another "intermediate form" seedling of *T. cuspidata nana* was the *T. cuspidata intermedia* introduced by Brown.

Other plants were used for specimens and hedges on the estate. A few of the best were planted in a nursery near his home and assigned numbers; from here they were introduced into the trade by purchase, gift, and theft. These "Hatfield Numbers" can be found in the stock blocks of some of the older nurseries and occasionally appear in the trade. The original plants are still standing on the Hunnewell estate where they are good-sized excurrent trees. Most of the labels are lost, and some of the better plants have been removed to other locations on the estate. Some of these plants are hardly worthy of a name, being excelled in growth rate and habit by superior cultivars which are in the trade.

Numbers 6, 7, and 8, Hatfield's "Second Irish," are in the trade as *"T. m. Irish"*. Number 8 is male with bright green radial leaves and dense compact habit. It was reported to be quite heat and drought-resistant by the late C. R. Runyan, superintendent of Spring Grove Cemetery, Cincinnati, Ohio. The name *T. m.* 'Runyan' is proposed for this cultivar. Numbers 6 and 7 are female, with the latter bearing heavier crops of late maturing seed. After Hatfield's death, Richard Wyman purchased the surplus stock, from which he selected *T. media wymani* and named material propagated from the seedling hedge *"T. m. brevicata"*.

Hatfield must have been fortunate enough to find a male-sterile *Taxus canadensis* from which he picked

the seed which produced the excurrent *"Taxus canadensis stricta,"* later named *Taxus hunnewelliana* by Rehder (32). He considered *T. canadensis* to be dioecious; however, all plants examined by the authors, including those on the Hunnewell estate, have been monoecious. Hatfield stated that this plant was isolated at least 100 feet from other *T. canadensis,* with several *T. cuspidata* nearby. The seedlings raised by Hatfield are definitely hybrids and remarkably uniform in habit.

MORPHOLOGY

The evergreen plants of the genus *Taxus* are small trees, 20 to 40 feet, rarely to 80 feet in *T. brevifolia* on the Pacific Coast, or shrubs of relatively slow growth. The branching habit of the excurrent tree is such that unpruned trees frequently have a square outline when young, becoming more rectangular or conical with age. The spread of the plant usually exceeds the height on plants grown as specimens.

The bark is reddish or purplish to dark chestnut brown, scaly, or exfoliating from the trunk and larger branches in thin flakes or long strips or rhytidomes. The bark is usually less than one-eighth inch thick, with the inner bark about one-sixteenth inch thick, according to Chang (10), who stresses the regularity of the alternate layers of secondary phloem tissue. Along a radial axis, the cells of the secondary phloem occur in this order: fiber, sieve cell, parenchyma, sieve cell, and fiber again. Thus a tangential layer of sieve cells is between a tangential layer of phloem fibers on one side and parenchyma on the other. The presence of numerous small crystals in cell walls of the phloem fiber of *T. brevifolia* agrees with the findings of earlier workers who studied *T. baccata,* according to Chang (10).

The wood is hard, dense, flexible, elastic, and fine-grained without resin ducts or parenchyma, according to Eames and McDaniels (15). The average dry weight is 39 lb. per cubic foot, while the color ranges from dark reddish brown to white. Coltman-Rogers (11) notes the durability of the wood in contact with soil and moisture.

The leaves are simple, flat, linear, often falcate, with distinct but short petioles attached to the branches by decurrent bases; arranged spirally, opposite on small seedlings, but often pectinate and appearing 2-ranked. The margins are entire and, in *T. canadensis,* slightly revolute. The species has two more or less broad stomate bands on the under side of the leaf which are yellowish to gray-green, but lighter than the margins and midrib. The stomate bands may not be very distinct on the exposed leaves of some cultivars. The single, unbranched midrib or vein is more or less prominent on the upper or lower surface of the leaf; it is without resin ducts. The color of the leaves is dark, glossy green in the species, but many cultivars are recognized by the glaucous or varying amounts of yellow or white coloring. The leaves may be thin and leathery to thick, succulent, and almost fleshy.

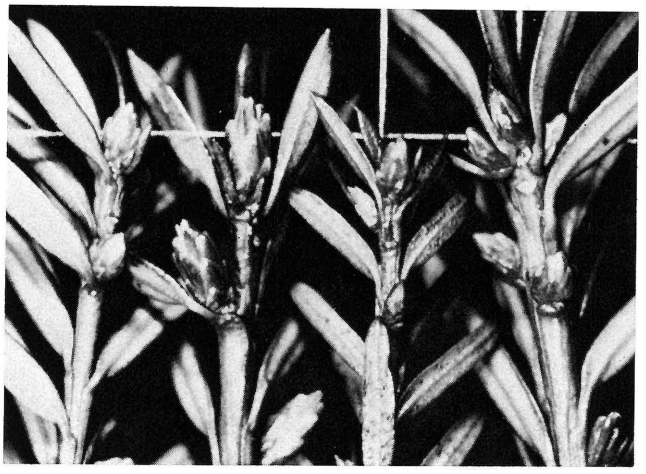


FIG. 1.—Winter buds showing imbricate scales.

The branchlets are slender, yellowish or dark olive green to bright reddish orange, usually green in the shade. The change in bark color on the 2-year twig is of taxonomic use. The bark texture of the twig may be thin and smooth, or thick, wrinkled, and leathery on some cultivars. The branchlets are arranged irregularly alternate, but sometimes constant within a cultivar, producing a definite, recognizable branching habit and determinate or indeterminate form of growth especially susceptible to alteration by shearing.

The winter buds (Fig. 1) are ovate, axillary, or terminal, with imbricate scales which are useful in taxonomy. The bud scales are persistent, except in *T. chinensis,* obtuse and thin, or acute, thickened, and ridged or keeled. The color is the same as that of the branchlet, or yellowish green.

The flowers (Fig. 2) are small, solitary or occasionally twinned, axillary, usually dioecious (monoecious in *T. canadensis),* and open in March or April. The female flower resembles an axillary vegetative bud, but is usually decurved or pendant, and is easily recognized on close inspection by the micropyle opening in the exposed ovule.

The male flower or pollen cone has several sterile scales at the base, with a stalked globose head of 6 to 14 stamens, each with 5 to 9 microsporangia or pollen sacs which are always on the lower surface. However, being terminal and coherent, they are more com-

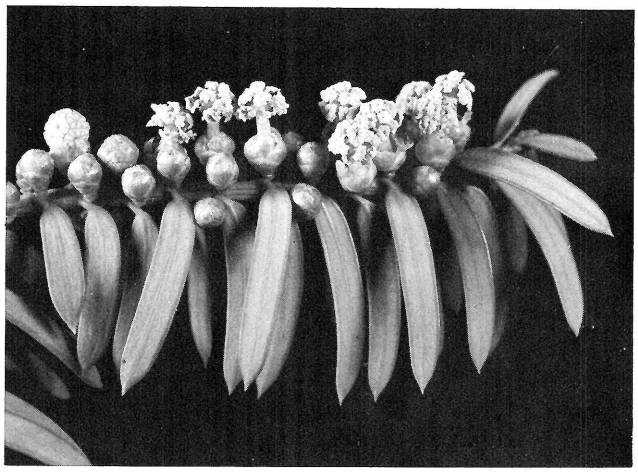


FIG. 2A.—Male flower buds or pollen cone with stalked globose head.

parable to the anther of angiosperms. The pollen is distributed by the wind.

The solitary seed of the Yew, which matures in late summer to fall of the same season, is sometimes called a "single seeded berry" or "berry-like fruit" (Fig. 3). The discoid to campanulate, fleshy, mucilaginous, scarlet outer seed coat, or arillus, with an open apex, is specific to the genus *Taxus*. However, in addition to all Taxads, arils are found in several genera of the angiosperms including *Euonymous, Celastrus, Magnolia,* and others. The shape of the aril is affected by growing conditions, maturity, and amount of seed set. The hard, ovoid, nut-like seed is about one-fourth inch in its greatest dimension, the apex is slightly 2-4 angled, the hilum is ovate, triangular, or squarish and more or less depressed. The seed, which is distributed by birds, does not germinate until the second season.

Deviations from the dioecious habit of the Yews have been observed by Dovaston (1), Matsuura and Suto (30), Elwes and Henry (16), Keen and Chadwick (24), and others. Usually a single branch or twig on a male tree will be observed bearing seed. These and the sectorial chimaera appearance of the twig in Figure 4 tend to support the hypothesis of Matsuura and Suto that such sports are true mutations of a sex-linked nature. However, Hatfield (19) and Keen and Chadwick (24) report observing entire young plants which changed from one sex to the other. This would support Schaffner's (34) view that sexuality in plants is physiological or ecological and not subject entirely to Mendelian laws. The fact that almost all plants of *T. canadensis* are monoecious, with each twig bearing flowers of both sexes, lends support to the former idea.

A study of the chromosomes of the genus *Taxus* was initiated by Keen (25) to determine whether the chromosomes would be of taxonomic value in recognizing the species, hybrids, and cultivars of Yew offered by the nursery trade in America. Keen (25) concluded after an extensive study that, in spite of the aberrant numbers and figures reported in the literature, the haploid chromosome number is 12, with in-

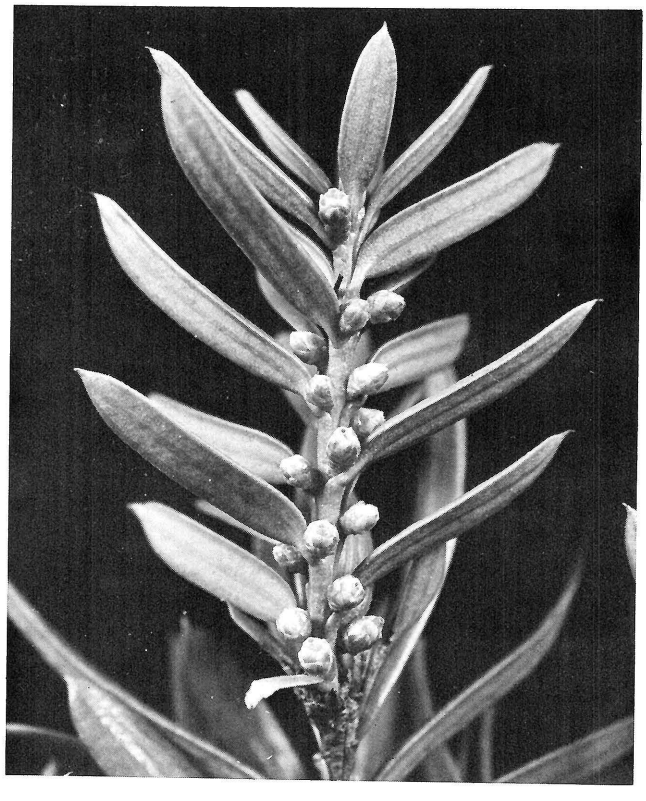


FIG. 2B.—Female flower buds showing decurved or pendant habit.

FIG. 3.—The berry-like fruit of Yew with its fleshy, mucilaginous, scarlet outer seed coat with the open apex.

significant differences in the number of chiasmata between the chromosomes of the different species and cultivars.

SEX AND FRUITING CHARACTERISTICS

Both dioecious and monoecious plants are found in the species and cultivars of Taxus. As noted earlier, sex reversion also has occurred in several cultivars.

Over the years of the project, the sex and fruiting characteristics of the various species and cultivars have been checked carefully. Sex is usually fairly easy to determine, but with some of the newer cultivars, plants may not have reached the stage of flower bud development and corrections may be necessary at a later date.

Fruiting habit has been characterized as light, light-medium, medium, medium-heavy, and heavy. The amount of fruit produced will vary to some extent from year to year, depending primarily on weather conditions. The classification of fruiting habit has been based on observations over a number of years and not on any one yearly record. Sex and fruiting characteristics of the Taxus species and cultivars are recorded in Table 1.

FIG. 4.—Apical twig of *Taxus media* 'Brownii' bearing seed and female flowers on the right and male flowers on the left.

TABLE 1.—Sex and Fruiting Characteristics of Taxus Species and Cultivars.

Name	Sex			Fruiting Habit					Notes
	Male	Female	Both	Light	Light-Medium	Medium	Medium-Heavy	Heavy	
Taxus baccata									
'Adpressa'		X				X			
'Aurea'			X	X					Usually female
'Compacta'	X								
'Dovastoniana'	X								*Sex reversion noted
'Erecta'	X								
'Expansa'		X		X					
'Fastigiata Aurea'		X		X					
'Glauca'	X								
'Michelii'		X		X					
'Nigra'	X								*Sex reversion noted
'Overeynderi'	X								
'Repandens'		X		X					
'Washingtonii'		X			X				
Taxus canadensis			X	X					Mostly monoecious
'Dwarf Hedge'			X	X					Usually female
Taxus cuspidata			X				X		Usually female
'Adams'	X								
'Aristocrat'		X				X			
'Aurescens'		X			X				
'Capitata'			X		X				
'Densa'		X		X					
'Expansa'		X					X		
'Hiti'	X								
'Intermedia'			X			X			
'Midget'		X		X					
'Nana'	X								*Sex reversion noted
'Prostrata'	X								
'Robusta'		X				X			
'Sieboldii'			X	X					
'Thayerae'		X				X			

*Cultivars marked with an asterisk have been observed to have an occasional twig or branch which reverted to the opposite sex.

(Continued on page 6)

TABLE 1 (Continued).—Sex and Fruiting Characteristics of Taxus Species and Cultivars.

Name	Sex			Fruiting Habit					Notes
	Male	Female	Both	Light	Light-Medium	Medium	Medium-Heavy	Heavy	
Taxus hunnewelliana			X				X		
'Globosa'			X	X					Usually female
Taxus media			X		X				
'Amherst'			X	X					Usually male
'Andorra'		X						X	
'Anthony Wayne'		X			X				
'Berryhill'		X		X					
'Brevicata'	X								
'Broad Beauty'	X								
'Brownii'	X								*Sex reversion noted
'Brownhelm'		X		X					
'Burr'	X								
'Chadwick'		X					X		
'Coleana'		X				X			
'Cole Type B'	X								
'Compacta'		X					X		
'Costich'	X								
'Densiformis'	X								
'Donewell'		X		X					
'Drulia'		X			X				Split aril
'Dutweilleri'			X			X			Usually male
'Emerald'		X			X				Formerly Mitiska No. 6 and Mitiska No. 33
'Everlow'	X								
'Fairview'	X								
'Flemer'			X	X					
'Flushing'		X		X					
'Grandifolia'	X								
'Green Candle'	X								
'Green Mountain'	X								
'Halloriana'		X		X					
'Hatfieldii'	X								True type—male
'Hatfield No. 2'	X								
'Hatfield No. 6'		X		X					
'Hatfield No. 18'	X								
'Hatfield No. 19'	X								
'Hatfield No. 23'	X								*Sex reversion noted
'Henryi'	X								
'Hicksii'		X						X	
'Hill'	X								
'Hoogendoorn'	X								
'Kelseyi'		X						X	*Sex reversion noted
'Kobel'	X								
'L. C. Bobbink'	X								
'Lodi'	X								
'Mitiska Upright'	X								
'Moon'		X					X		
'Natorp'		X		X					
'Newport'		X		X					
'Ohio Globe'	X								Formerly Mitiska No. 5
'Peterson'		X		X					
'Pilaris'	X								
'Pyramidalis'		X		X					
'Robusta'	X								
'Roseco'	X								
'Runyan'	X								*Sex reversion noted, Formerly *Taxus media* No. 8
'Sebian'	X								
'Sentinalis'		X		X					
'Stovekenii'	X								
'Stricta'	X								
'Totem'		X			X				
'Vermeulen'		X			X				
'Viridis'	X								
'Wardii'		X					X		
'Wellesleyana'	X								*Sex reversion noted
'Wilsonii'	X								

*Cultivars marked with an asterisk have been observed to have an occasional twig or branch which reverted to the opposite sex.

PROPAGATION

Since this study did not consider propagation, the practices generally followed in commercial nurseries will be discussed only briefly.

Yews are propagated by seed, cuttings, and grafting. Seed finds its main use in producing excurrent plants of the Japanese Yew or for the production of new cultivars. Seed should be collected and cleaned as soon as possible. They can be stratified in peat and sand and held at a temperature of 35-50° until the following October. Then the seeds can be sown in flats and held in greenhouses, polyhouses, or frames until the following spring when the seedlings can be set in transplant beds. Another method frequently followed is to sow 1-year seed in protected outside beds in early August. Germination should occur the following spring.

Cuttings of most species and cultivars root readily, and are generally used as a means of propagation of cultivars except *T. cuspidata* 'Capitata'. In fact, plants of the Upright Japanese Yew can be grown from cuttings by selecting the erect, terminal shoots as propagating wood. Cuttings 4-8 inches in length may be handled in greenhouses, poly-covered quonset houses, or frames. Some nurserymen take cuttings in late March and root them in cold frames. Others take cuttings in mid-August, sticking them in a favorable rooting medium in cold frames. Rooting will take place the following spring. Still others prefer to handle the cuttings in greenhouses or poly-covered quonset houses, taking the cuttings from November to January.

Grafting of Yews is not commonly practiced commercially, although some of the golden foliage and other hard-to-root cultivars may be propagated by this method.

CULTURE

General: Soils in the *Taxus* plantation of the Secrest Arboretum are mostly Wooster silt loam. Drainage was not adequate for satisfactory growth at the start of the project and several plants were lost because of poor drainage. This situation was corrected by installing tile drainage. The planting area was fully exposed, although protected from sweeping winds to some degree on the south by evergreen and deciduous woods about 50-60 yards from the south side of the *Taxus* area. Spacing was 10 x 12 feet. Five plants of a kind were planted for most accessions.

In order that these plants might exhibit their natural growth habit, trimming or pruning has been held to a minimum, consisting of one light trimming and the taking of a limited amount of cutting wood from some specimens. The older plants in the collection were fertilized once with a commercial fertilizer. Sod culture has been maintained but in most cases the plants were mulched following planting.

While planting distances seemed very adequate for the first 2 decades, crowding occurred in the last decade, necessitating considerable thinning. However, one or more specimens have been retained for most accessions.

There has been a slight infestation of black vine weevil in the plantation, but widespread treatment has not been required.

Size Records: Sizes of the *Taxus* species and cultivars were recorded in 1961 and again in 1973 when photographs were taken of representatives of each accession. Height and width measurements

TABLE 2.—Average Height and Spread of Representative Taxus Species and Cultivars, Secrest Arboretum, Ohio Agricultural Research and Development Center, Wooster, 1961-1973.

	Year Planted	1961 - Spring		1973 - Fall	
		Height	Width	Height	Width
		Feet		Feet	
Taxus baccata 'Adpressa'	1942	5½	5	8	10
Taxus baccata 'Aurea'	1942	6	6½	7½-8	20
Taxus baccata 'Compacta'	1942	8	8	12-13	18-20
Taxus baccata 'Dovastoniana'	1942	6	12	8	25-27
Taxus baccata 'Erecta'	1942	8	6½	8-9	14-15
Taxus baccata 'Expansa'	1942	7	8	12	12-14
Taxus baccata 'Fastigiata Aurea'	1931			8-9	3-3½
Taxus baccata 'Glauca'	1942	7½	5½	10-11	9-10
Taxus baccata 'Michelii'	1942	2½	4½	4	12-14
Taxus baccata 'Nigra'	1942	8	11	9-10	18-20
Taxus baccata 'Overeynderi'	1944	4½	2	8	3
Taxus baccata 'Repandens'	1942	3	7	3½	12
Taxus baccata 'Washingtonii'	1929			7-8	15-18
Taxus canadensis	1942	3½	8	4½-5	8-10
Taxus canadensis 'Dwarf Hedge'	1942	3	7	5	14-16
Taxus cuspidata	1942	6½	10	8-9	16-18
Taxus cuspidata 'Adams'	1942	12	14	13-14	25-27
Taxus cuspidata 'Aristocrat'	1958	2½	3	7-8	12
Taxus cuspidata 'Aurescens'	1945	1½	3	2	6-8
Taxus cuspidata 'Capitata'	1942	9	10	14-15	12-14

(Continued on page 8)

TABLE 2 (Continued).—Average Height and Spread of Representative Taxus Species and Cultivars, Secrest Arboretum, Ohio Agricultural Research and Development Center, Wooster, 1961-1973.

	Year Planted	1961 - Spring		1973 - Fall	
		Height	Width	Height	Width
		Feet		Feet	
Taxus cuspidata 'Densa'	1942	2½	3½	4-4½	5-6
Taxus cuspidata 'Expansa'	1943	3	3½	6-7	10
Taxus cuspidata 'Hiti'	1946	7½	7	10-11	15
Taxus cuspidata 'Intermedia'	1942	6	7½	10-11	20-22
Taxus cuspidata 'Midget'	1945	3	4	4	6
Taxus cuspidata 'Nana'	1942	4	6½	7½	10-12
Taxus cuspidata 'Prostrata'	1942	5½	10	10	22-24
Taxus cuspidata 'Robusta'	1942	6½	7½	9	20
Taxus cuspidata 'Sieboldii'	1942	7	10	9	15-17
Taxus cuspidata 'Thayerae'	1942	8	14	10	18-20
Taxus hunnewelliana	1942	6½	12	9-11	18-20
Taxus hunnewelliana 'Globosa'	1942	6	11	8-9	25-28
Taxus media	1946	5	8½	10	20-22
Taxus media 'Amherst'	1951	4	4½	8-10	13-15
Taxus media 'Andorra'	1942	8	6½	10-12	12
Taxus media 'Anthony Wayne'	1960	1	½	8-9	6
Taxus media 'Berryhill'	1951	3½	6	6-7	12-14
Taxus media 'Brevicata'	1942	8	12	10-11	26-28
Taxus media 'Broad Beauty'	1969			2	4
Taxus media 'Brownii'	1942	8	9	11-12	15
Taxus media 'Brownhelm'	1951	5	7½	9-10	12
Taxus media 'Burr'	1964			4½	5-6
Taxus media 'Chadwick'	1951	2½	6	5-6	24-25
Taxus media 'Coleana'	1942	7	7	9	12
Taxus media 'Cole Type B'	1954	3	3½	5-6	15
Taxus media 'Compacta'	1942	8	13	10	25-27
Taxus media 'Costich'	1942	10	5	12-13	10-12
Taxus media 'Densiformis'	1958	2	2	6-7	10-12
Taxus media 'Donewell'	1957	2	2½	7	5-6
Taxus media 'Drulia'	1953	2½	5	8	12-14
Taxus media 'Dutweilleri'	1942	10	14	12-13	25-27
Taxus media 'Emerald'	1951	3	4	6-7	8-10
Taxus media 'Everlow'	1969			2	6
Taxus media 'Fairview'	1958	2½	2	6-7	10-12
Taxus media 'Flemer'	1942	5½	10	8	22-24
Taxus media 'Flushing'	1962			9	2-2½
Taxus media 'Grandifolia'	1962			7	2-2½
Taxus media 'Green Candle'	1951	4	1½	8	3-4
Taxus media 'Green Mountain'	1956	2	3	5-6	16-18
Taxus media 'Halloriana'	1948	5½	7	9-10	16-18
Taxus media 'Hatfieldii'	1942	7	6	9-10	10-12
Taxus media 'Hatfield No. 2'	1942	8	9	12	15-16
Taxus media 'Hatfield No. 6'	1942	5½	8	10	15-17
Taxus media 'Hatfield No. 18'	1942	6½	7½	10-12	18-20
Taxus media 'Hatfield No. 19'	1942	8	14	12-13	20-22
Taxus media 'Hatfield No. 23'	1942	5½	9	9-10	15-17
Taxus media 'Henryi'	1954	3	4½	8-9	14-15
Taxus media 'Hicksii'	1942	9	4½	12-13	12
Taxus media 'Hill'	1942	7½	8	9-10	15-16
Taxus media 'Hoogendoorn'	1958	1	1½	5-6	5-6
Taxus media 'Kelseyi'	1942	9	7½	12-13	12-14
Taxus media 'Kobel'	1962			5-6	12
Taxus media 'L. C. Bobbink'	1968			4-5	3-4
Taxus media 'Lodi'	1958	3	1½	8-9	8
Taxus media 'Mitiska Upright'	1951	3	2	6	3-4
Taxus media 'Moon'	1950	6	5½	9-10	15
Taxus media 'Natorp'	1957	3	6	6-7	15-17
Taxus media 'Newport'	1954	1½	1	3-3½	3-3½
Taxus media 'Ohio Globe'	1951	4½	5	9-10	10
Taxus media 'Peterson'	1962			5	9-10
Taxus media 'Pilaris'	1962			9	2½-3
Taxus media 'Pyramidalis'	1962			7-8	3-4
Taxus media 'Robusta'	1962			8	2-3
Taxus media 'Roseco'	1962			6-7	15-17
Taxus media 'Runyan'	1942	8	12	9-11	20-22
Taxus media 'Sebian'	1942	5	11	8-9	24-26
Taxus media 'Sentinalis'	1962			8-9	2-2½
Taxus media 'Stovekenii'	1942	10	5	20	12
Taxus media 'Stricta'	1962			7-8	3
Taxus media 'Totem'	1946	6	2½	8-9	4-5
Taxus media 'Vermeulen'	1946	4	4	8	15-16
Taxus media 'Viridis'	1962			8-9	3-3½
Taxus media 'Wardii'	1942	4	9	6	25-27
Taxus media 'Wellesleyana'	1942	8	8	11-12	15-16
Taxus media 'Wilsonii'	1953	5	4½	9-10	15

are estimates of average size of the one to five plants of a kind. While the various accessions varied somewhat at the time of planting, they were mostly 15-18-inch or 18-24-inch specimens. Figures in Table 2 indicate the rate of growth during the early years following planting, and in most cases the increased growth rate during the last 12 years of the project.

Winter Injury Records: Data on winter injury were recorded for the years 1947-48, 1950-51, 1951-52, 1952-53, 1958-59, 1960-61, and 1962-63 (Table 3). Damage was more severe during these years than others during the project. Except for the *Taxus baccata* cultivars, winter damage has been slight, consisting mostly of slight foliage burn or discoloration and delayed breaking of terminal buds. Several of the *T. baccata* cultivars made remarkable recovery following rather severe injury.

Meteorological Data: To provide background information for the hardiness and winter injury data presented in Table 3, meteorological data are given in

TABLE 3.—Winter Injury Ratings* for Taxus Species and Cultivars During Selected Test Winters, Secrest Arboretum, Ohio Agricultural Research and Development Center, Wooster.

	1947-48	1950-51	1951-52	1952-53	1958-59	1960-61	1962-63
Taxus baccata 'Adpressa'	3-4	4-5	2-3	1	3-4	3	3-4
Taxus baccata 'Aurea'	4	5	2-3	2	2-3	2-3†	4
Taxus baccata 'Compacta'	4	3-4	2-3	2	2-3	2	3-4
Taxus baccata 'Dovastoniana'	2-3	2-3	1	2	3	2	3-4
Taxus baccata 'Erecta'	4	4	2-3	1	3	3-4	3-4
Taxus baccata 'Expansa'	2-3	2-3	1-2	1	1-2	1	2
Taxus baccata 'Glauca'	4	4-5	2-3	1	3-4	2	4-5
Taxus baccata 'Michelii'	3	3-4	1	1	1-2	2	2
Taxus baccata 'Nigra'	3-4	4-5	2-3	2	3-4	1-2	3-4
Taxus baccata 'Overeynderi'	3-4	4	2	1	3	2-3	4-5
Taxus baccata 'Repandens'	1-2	3-4	1	1	1	1	2
Taxus canadensis	1-2	1	1-2	2-3	2-3	1-2	2
Taxus canadensis 'Dwarf Hedge'	1-2	1	1-2	2-3	2	1	1
Taxus cuspidata	1	1	1	2	1-2	1	1
Taxus cuspidata 'Adams'	1	1	1	2	1	1	1
Taxus cuspidata 'Aristocrat'					1	1	1-2
Taxus cuspidata 'Aurescens'					2-3	1	4-5
Taxus cuspidata 'Capitata'	1	1	1	1-2	1	1	1
Taxus cuspidata 'Densa'	1	1	1	1	1	1	1
Taxus cuspidata 'Expansa'	1	1	1	1-2	1-2	1	1
Taxus cuspidata 'Hiti'		1	1	2	1-2	1	1-2
Taxus cuspidata 'Intermedia'	1	1	1	2-3	1	1	1
Taxus cuspidata 'Midget'	1	1	1	1	1	1	1
Taxus cuspidata 'Nana'	1	1	1	1-2	1-2	1-2	1-2
Taxus cuspidata 'Prostrata'	1-2	1	1	1	1	1	2
Taxus cuspidata 'Robusta'	1	1	1	2	1	1	1
Taxus cuspidata 'Sieboldii'	1	1	1	2-3	1	1	1
Taxus cuspidata 'Thayerae'	1	1	1	1-2	1	1	1-2
Taxus hunnewelliana	1	1	1	1	1	1	1-2
Taxus hunnewelliana 'Globosa'	3	3-4	2	2	2	1-2	2
Taxus media	1	1	1	1-2	1-2	1-2	2-3
Taxus media 'Amherst'			1	2	1	1	1
Taxus media 'Andorra'	1	1	1	1	1-2	1	1
Taxus media 'Anthony Wayne'						1-2	1
Taxus media 'Berryhill'			1	2	1-2	1	1-2
Taxus media 'Brevicata'	1	1-2	1	2	1-2	1	1-2
Taxus media 'Brownii'	1	1	1	1-2	1	1	1-2
Taxus media 'Brownhelm'			1	2-3	1	1	2
Taxus media 'Chadwick'			1	1	1	1	1-2
Taxus media 'Coleana'	1	1	1	2	2-3	1	2
Taxus media 'Cole Type B'					3-4	2	2-3
Taxus media 'Compacta'	1-2	1	1	1	1	1	1-2
Taxus media 'Costich'	1	1-2	1	1	1-2	1-2	1-2
Taxus media 'Densiformis'					2-3	1	2
Taxus media 'Donewell'					1	1	1
Taxus media 'Drulia'					1-2	1	2
Taxus media 'Dutweilleri'	1	1	1	1-2	1	1	1
Taxus media 'Emerald'				1	1	1	1
Taxus media 'Fairview'					2-3	1	2
Taxus media 'Flemer'	1	1	1	1-2	1	1	1-2
Taxus media 'Flushing'							1-2
Taxus media 'Grandifolia'							2
Taxus media 'Green Candle'			2	1	1	1	1
Taxus media 'Green Mountain'					2-3	1	2-3

*1=No injury. 2=Slight foliage burn or discoloration, delayed breaking of terminal buds. 3=Moderate foliage burn, terminal buds injured. 4=Severe foliage burn and some twig kill back. 5=Twigs killed back 2 to 6 inches.

†Figures in bold face indicate this type of injury predominated.

(Continued on page 10)

TABLE 3 (Continued).—Winter Injury Ratings* for Taxus Species and Cultivars During Selected Test Winters, Secrest Arboretum, Ohio Agricultural Research and Development Center, Wooster.

	1947-48	1950-51	1951-52	1952-53	1958-59	1960-61	1962-63
Taxus media 'Halloriana'		1-2	1	2	1	1	1-2
Taxus media 'Hatfieldii'	1-2	1-2	1	2	1-3	1-2	1-2
Taxus media 'Hatfield No. 2'	1	1	1	2	1-2	1	1
Taxus media 'Hatfield No 6'	1-2	1	1	1	1	1	1
Taxus media 'Hatfield No. 18'	1	1	1	1	1	1	1-2
Taxus media 'Hatfield No. 19'	1	1-2	1	2	1	1	1
Taxus media 'Hatfield No. 23'	1	1	1	2-3	1	1	1-2
Taxus media 'Henryi'	1	1	1	1-2	1-2	1	1-2
Taxus media 'Hicksii'					2-3	1	1-2
Taxus media 'Hill'	1	1	1	2	1-2	1	1
Taxus media 'Hoogendoorn'					1-2	1	1-2
Taxus media 'Kelseyi'	1	1	1	2	1-2	1	1-2
Taxus media 'Kobel'							1
Taxus media 'Lodi'					1-2	1	1-2
Taxus media 'Mitiska Upright'					1-2	1-2	1-2
Taxus media 'Moon'		1-2	1	2	1-2	1	2
Taxus media 'Natorp'					1-2	1	1
Taxus media 'Newport'					1-2	1	2
Taxus media 'Ohio Globe'			1-2	2	1	1	1
Taxus media 'Peterson'							1-2
Taxus media 'Pilaris'							1-2
Taxus media 'Pyramidalis'							1-2
Taxus media 'Robusta'							1-2
Taxus media 'Roseco'							1-2
Taxus media 'Runyan'	1	1	1	1	1	1	1-2
Taxus media 'Sebian'	1	1	1	2	1-2	1	1-2
Taxus media 'Sentinalis'							1-2
Taxus media 'Stovekenii'	1	1	1	1	1	1	1
Taxus media 'Stricta'							1-2
Taxus media 'Totem'					2	1	2
Taxus media 'Vermeulen'	2	1-2	1	1	2-3	1-2	2-3
Taxus media 'Viridis'							1-2
Taxus media 'Wardii'	1-2	1-2	1	2-3	1-2	1	1-2
Taxus media 'Wellesleyana'	1-2	1-2	1	1	2	1	2-3
Taxus media 'Wilsonii'					1	1	1

*1=No injury. 2=Slight foliage burn or discoloration, delayed breaking of terminal buds. 3=Moderate foliage burn, terminal buds injured. 4=Severe foliage burn and some twig kill back. 5=Twigs killed back 2 to 6 inches.

†Figures in bold face indicate this type of injury predominated.

TABLE 4.—Meteorological Data Recorded for Several Winters, Ohio Agricultural Research and Development Center, Wooster, 1947-48.

Date	Temperature* °F Max.	Min.	Diff.	Relative Humidity (%) 12 Noon	Character of Day	Notes
Nov.						
7	60	40	20		Cloudy	On Nov. 9 temperature dropped from
10	58	33	25		Partly Cloudy	maximum of 52° to 32°, warmed to
30	28	11	17		Cloudy	58°, then dropped to 33° on Nov. 10.
Dec.						
8	54	27	27		Cloudy	Marked variation between maximum
20	43	14	29		Partly Cloudy	and minimum temperatures early,
29	31	11	20		Partly Cloudy	middle, and end of month.
Jan.						
8	48	24	24	56	Cloudy	Minimum temperature below 10° for
9	48	29	19	84	Cloudy	15 days during Jan. Very cold (01°
14	20	00	20	60	Cloudy	to 08°) between Jan. 22 and Jan. 31
20	34	08	26	40	Cloudy	except for 2 days when it was 13° and 10°.
Feb.						
2	34	00	34	51	Partly Cloudy	Minimum temperature below 10° from
18	63	34	29	46	Clear	Feb. 1 to Feb. 9 except 12° on Feb. 3
19	63	30	33	54	Cloudy	and 10° on Feb. 4. Marked variation
20	50	14	03	56	Clear	between maximum and minimum temperatures Feb. 17-21.
Mar.						
12	25	—09	34	38	Cloudy	Marked variation between maximum
14	54	16	38	36	Clear	and minimum temperatures March 11
21	77	62	15		Cloudy	to 14. Minimum temperature for this period 02° to 09°.

*Figures in bold face type indicate the maximum and minimum temperatures, and the greatest temperature difference occurring during the month.

Table 4. Conditions responsible for winter injury of Taxus undoubtedly vary from year to year. Three major reasons can be cited: 1) the condition in which the plants go into the winter, 2) severe cold periods of several days or weeks duration, and 3) marked and rapid changes in temperature. Water relations are influenced by snow cover and extent of soil freezing during the winter.

TABLE 4 (Continued).—Meteorological Data Recorded for Several Winters, Ohio Agricultural Research and Development Center, Wooster, 1950-51.

Date	Temperature* °F Max.	Min.	Diff.	Relative Humidity (%) 12 Noon	Wind Velocity and Direction	Character of Day	Notes
Nov.							
1	**80**	59	21	48	9.7 SW	Partly Cloudy	Maximum temperature from Nov. 24-30 ranged from 20° to 36°. Minimum temperature for same period ranged from 06° to 24°.
14	50	19	**31**	82	6.6 SW	Clear	
25	20	**06**	14	70	12.1 NW	Clear	
Dec.							
3	**56**	30	26	73	8.3 SW	Cloudy	Maximum temperature in month mostly between 20° and 30°. Minimum temperature consistently below freezing.
21	18	—**16**	34	62	1.8 SW	Clear	
28	28	—14	**42**	40	1.4 NW	Clear	
Jan.							
1	39	**08**	**31**	62	9.1 SW	Clear	Warm during the middle of the month; cold from Jan. 21-31.
20	**61**	34	27	73	16.4 SW	Cloudy	
30	14	**04**	10	53	5.5 N	Partly Cloudy	
Feb.							
3	26	—**13**	**39**	65	5.9 SW	Clear	Consistently cold between Feb. 1 and Feb. 10. 5 days with minimum temperature below 0°. Warm temperature Feb. 18-28.
19	**62**	41	21	38	8.9 SW	Partly Cloudy	
Mar.							
3	67	31	**36**	78	10.7 NW	Cloudy	Maximum temperature 32° or above for entire month. Cold from March 19-22; 21° to 15°.
6	**70**	36	34	58	9.9 SW	Clear	
20	35	**15**	20	64	8.7 W	Clear	

TABLE 4 (Continued).—Meteorological Data Recorded for Several Winters, Ohio Agricultural Research and Development Center, Wooster, 1951-52.

Date	Temperature* °F Max.	Min.	Diff.	Relative Humidity (%) 12 Noon	Wind Velocity and Direction	Character of Day	Notes
Nov.							
13	**65**						Extremes in temperature occurred Nov. 8-10 and Nov. 20-22.
20	32	14	18	48	3.5 SW	Clear	
21	46	**15**	**31**	37	11.2 SW	Clear	
Dec.							
3	**63**	32	31	36	11.2 SE	Clear	Maximum temperature 57-64°, with minimum 23-32° between Dec. 1 and Dec. 5. Maximum temperature 18-32°, with minimum —13-20° between Dec. 12 and Dec. 19.
16	05	—**13**	18	58	6.0 SW	Clear	
17	20	—12	**32**	60	8.2 S	Partly Cloudy	
31	**63**	34	29				
Jan.							
1	**62**	33	**29**	96	5.5 SW	Cloudy	Marked variation between maximum and minimum temperatures early and middle of month. 27 days of month with minimum temperature below 32°.
20	54	25	**29**	67	9.7 NW	Cloudy	
29	17	**06**	11	52	4.4 NW	Partly Cloudy	
30	21	**06**	15	50	7.8 SW	Clear	
Feb.							
8	54	30	24	69	13.2 S&W	Cloudy	Minimum temperature consistently below 32° for month except first 4 days. Marked variation in temperature between maximum and minimum on Feb. 10 (28°), Feb. 15, and Feb. 26.
15	44	**15**	29	30	4.4 NE	Clear	
26	46	**15**	**31**	45	2.3 S	Clear	
28	**54**	27	27	54	5.0 SE	Partly Cloudy	
Mar.							
2	31	**08**	23	62	6.2 SE	Partly Cloudy	Minimum of 29° on March 3 to maximum of 25° on March 4. Minimum of 24° on March 12 to maximum of 52° and minimum of 28° on March 13. Minimum of 28° on March 29 to maximum of 63° and minimum of 21° on March 30.
20	**67**	34	33	48	2.6 E	Partly Cloudy	
30	63	**21**	**42**	50	7.4 S	Partly Cloudy	

*Figures in bold face type indicate the maximum and minimum temperatures, and the greatest temperature difference occurring during the month.

TABLE 4 (Continued).—Meteorological Data Recorded for Several Winters, Ohio Agricultural Research and Development Center, Wooster, 1952-53.

Date	Temperature* °F Max.	Min.	Diff.	Relative Humidity (%) 12 Noon	Wind Velocity and Direction	Character of Day	Notes
Nov.							
2	70	44	26	50	9.1 SW	Clear	Major variations during month: minimum of 27° on Nov. 4 to maximum of 62° and minimum of 28° on Nov. 5. Minimum of 26° on Nov. 13 to maximum of 62° and minimum of 28° on Nov. 14.
5	62	28	34	30	11.9 SW	Clear	
14	62	28	34	36	5.8 S	Clear	
17	70	52	18	59	5.2 S	Partly Cloudy	
29	32	08	24	54	6.2 SW	Partly Cloudy	
Dec.							
7	54	24	30	50	7.3 SW	Clear	Probably no foliage damage during Dec. Maximum temperature 32° or above for 25 days of month. Minimum temperature 32° or below for 24 days of month.
9	63	51	12	71	9.5 S-SW	Partly Cloudy	
28	30	09	21	51	8.4 S	Clear	
Jan.							
6	18	03	15	66	4.2 W, S, E, N	Clear	Consistently cold during month except for period Jan. 13-18 when maximum temperature was in 50's.
15	58	35	23	67	13.8 S-SW	Clear	
16	58	22	36	100	6.7 NW	Cloudy	
Feb.							
18	43	—01	44	54	12.0 W	Clear	Maximum temperature mostly in 30-40° range. Minimum temperature 32° or below for 25 of the 28 days.
21	59	23	36	62	12.8 S-SW	Partly Cloudy	
Mar.							
8	26	12	14	60	5.5 W	Clear	Minimum temperature on March 20 was 28° F., rising to 71° on March 21 and remaining warm for next 4 days, with minimum temperature dropping to 31° on March 26.
9	35	12	23	61	4.2 SW	Clear	
21	71	37	34	44	3.4 SE	Clear	
31	56	22	34	44	3.4 E	Clear	

TABLE 4 (Continued).—Meteorological Data Recorded for Several Winters, Ohio Agricultural Research and Development Center, Wooster, 1958-59.

Date	Temperature* °F Max.	Min.	Diff.	Relative Humidity (%) 12 Noon	Wind Velocity and Direction	Character of Day	Notes
Nov.							
17	74	63	11	97	8.4 SW	Cloudy	Warm up to Nov. 21. Only 1 day (Nov. 7) with minimum temperature below 32° (25°). Last 10 days of month minimum temperature consistently below freezing.
23	56	24	32	58	4.7 S	Clear	
29	25	01	24	76	10.8 NW	Clear	
Dec.							
7	18	02	16	72	5.8 SW	Partly Cloudy	A cold month with maximum temperature mostly between 14° and low 40's. Minimum temperature below 32° for entire month except on Dec. 4 (34°).
22	42	11	31	74	6.9 SW	Clear	
29	54	26	28	67	5.3 NE	Partly Cloudy	
Jan.							
4	34	00	34	76	10.0 NW	Partly Cloudy	A cold month with minimum temperature 10° or below for 15 days. Extreme variation in temperature Jan. 20-22. Minimum temperature on Jan. 20 12°; maximum temperature on Jan. 21 61°; minimum on Jan. 22 12°.
17	14	00	13	78	6.9 SW	Clear	
21	61	45	16		15.5	Cloudy	
Feb.							
10	63	29	34	70	15.4 W	Partly Cloudy	Minimum temperature consistently below 32° for first 12 days of month. A warm period (54°) followed by another cold period Feb. 18-23, with minimum temperature 01° to 22°.
12	52	17	35	53	7.7 SW	Clear	
19	14	01	13	72	5.1 NW	Clear	
Mar.							
22	32	15	17	50	3.1 NW	Clear	Major variation between maximum and minimum temperatures March 22-26. Maximum temperature ranging from 54°-73°, with minimum temperature 15°-34° for same period.
23	59	16	43	27	5.6 SW	Clear	
25	73	34	39	26	4.8 NW-NE	Clear	

*Figures in bold face type indicate the maximum and minimum temperatures, and the greatest temperature difference occurring during the month.

TABLE 4 (Continued).—Meteorological Data Recorded for Several Winters, Ohio Agricultural Research and Development Center, Wooster, 1960-61.

Date	Temperature* °F Max.	Min.	Diff.	Relative Humidity (%) 12 Noon	Wind Velocity and Direction	Character of Day	Notes
Nov.							
15	**66**	55	11	56	11.1 SW	Clear	Major variations in temperature: minimum of 19° on Nov. 12 to maximum of 62° and minimum of 27° on Nov. 15. Minimum of 53° on Nov. 28 to maximum of 61° and minimum of 20° on Nov. 29.
29	61	20	**41**	71	15.4 W	Partly Cloudy	
30	29	18	11	74	12.7 W-NW	Cloudy	
Dec.							
5	**62**	31	**31**		7.1 SW	Clear	A cold month with maximum temperature above 32° 5 days and minimum temperature below 32° 30 days. 14 days with minimum temperature 10° or below.
13	14	**01**	13	55	9.9 SW	Clear	
Jan.							
5	39	**00**	**39**	75	10.1 S	Clear	Maximum temperature above 32° for 13 days of month. Minimum temperature above freezing only 3 days of month. From Jan. 20-31, minimum temperature below 10° except on Jan. 25 (14°).
13	48	19	29	50	2.6 SW	Clear	
21	16	**00**	16	68	10.6 SW	Clear	
26	14	**00**	14	87	4.8 SW	Cloudy	
Feb.							
9	38	**00**	**38**	54	7.8 SW	Clear	Cold during first 12 days of month. Warm temperature on Feb. 18 (minimum 51°), followed by cold temperature on Feb. 19 and 20 (minimum 22° and 18°).
19	**60**	22	38	78	6.8 SW	Partly Cloudy	
24	68	36	32	52	7.1 SW	Clear	
Mar.							
11	**56**	20	**36**	48	8.5 SW		Major variation between maximum and minimum temperatures. Minimum of 18° on March 19 to maximum of 56° and minimum of 20° on March 11. Minimum of 20° on March 11 to maximum of 52° and minimum of 24° on March 12.
17	31	14	17	40	7.5 NW		
27	**72**	42	30	32	10.4 SW	Partly Cloudy	

TABLE 4 (Continued).—Meteorological Data Recorded for Several Winters, Ohio Agricultural Research and Development Center, Wooster, 1962-63.

Date	Temperature* °F Max.	Min.	Diff.	Relative Humidity (%) 12 Noon	Wind Velocity and Direction	Character of Day	Notes
Nov.							
26	45	18	27	45	1.7 E	Clear	Probably no winter damage during Nov. Minimum temperature in 20's late in month.
30	**64**	26	**38**	46	0.3	Clear	
Dec.							
2	**66**	22	**44**	44	2.5 E	Partly Cloudy	Temperature mild early in month. Maximum temperature below 32° 19 days of month. Minimum temperature consistently below 32°; 11 days 10° or below.
11	14	**00**	14	70	5.7 SW	Partly Cloudy	
Jan.							
10	**47**	31	16	73	3.8 SW-NE	Cloudy	A cold month with maximum temperature above 32° only 10 days of month, mostly in 30's. Minimum temperature below 32° for entire month. Minimum temperature 10° or below for 15 days of month.
20	37	**02**	**35**	74	9.0 W	Cloudy	
27	16	**00**	16	74	7.7 SW	Partly Cloudy	
31	25	**00**	25	67	3.1 SE	Clear	
Feb.							
6	**52**	22	30	55	2.3 SW	Partly Cloudy	A cold month with maximum temperature above 32° for 12 days of month. Minimum temperature below 32° for entire month. Minimum temperature 10° or below for 12 days of month. Extreme cold Feb. 21-23, with maximum temperature 9° and minimum 5°.
20	36	**05**	**31**	63			
23	23	**02**	21	59	12.2 SW	Clear	
Mar.							
2	29	**13**	16	51	4.1 SW	Clear	Probably no winter damage during March.
29	**76**	36	**40**	38	7.8 SW	Clear	

*Figures in bold face type indicate the maximum and minimum temperatures, and the greatest temperature difference occurring during the month.

FIG. 5.—Overall view of snow cover and damage in *Taxus* collection following 24-inch snowfall of Dec. 1, 1974.

Snow Damage: Considerable damage to the Taxus plants in the Secrest Arboretum occurred when more than 24 inches of heavy snow fell on Dec. 1, 1974. The heavy snow was on the plants for more than 2 weeks, causing considerable breakage of branches. There was considerable "pulling-apart" of the erect branches of the narrow fastigiate or columnar cultivars. A record of the damage to the various species and cultivars was delayed to mid-summer of 1975 because Taxus has considerable recuperative power.

Some degree of difficulty was experienced in attempting to categorize the extent of the snow damage to the various species and cultivars. In several cases, all specimens of a cultivar within the same group did not exhibit the same degree of damage; it varied from a decidedly open top to one of attaining nearly natural growth habit. Broken branches were apparent with several cultivars. Undoubtedly there are cases where branches are not broken, but the bark has been sprung or crushed to the extent that natural branch habit recovery is doubtful.

In analyzing the extent of the damage, it should be kept in mind that the plants in the Taxus plantation have not been pruned, but were left to grow according to their natural habit. Consequently, the damage was much greater, with less recovery, than would be expected under normal landscape maintenance practices. As a rule, the older, larger, narrow upright, or wide upright spreading cultivars were more extensively damaged than the smaller specimens and those of the more stiffly branched, rounded, or globe forms or the wide-spreading cultivars such as *T. media* 'Flemer' and *T. media* 'Wardii'.

Data indicating the extent of the snow damage were recorded on July 9, 1975, and are reported in Table 5. Some cultivars have been assigned a single number indicating extent of damage. With others, two numbers are assigned because of the damage variation within a cultivar group.

TABLE 5.—Snow Damage to Taxus Species, Clones, and Cultivars, Ohio Agricultural Research and Development Center, Wooster, Dec. 1, 1974.

Name	Damage Ratings*	Comments
Taxus baccata 'Adpressa'	3-4	Some broken branches
Taxus baccata 'Aurea'	2-3†	Variable; centers open on most specimens; large plants
Taxus baccata 'Compacta'	1-2	Nearly recovered; large plants
Taxus baccata 'Dovastoniana'	1-2	Large plants
Taxus baccata 'Erecta'	1-2	Large plants
Taxus baccata 'Expansa'	1-2	Large plants; nearly recovered natural habit
Taxus baccata 'Glauca'	3	Large plants
Taxus baccata 'Michelii'	1	
Taxus baccata 'Nigra'	3-4	Large plants
Taxus baccata 'Overeynderi'	1-2	
Taxus baccata 'Repandens'	1	
Taxus canadensis	2-3	Some broken branches
Taxus canadensis 'Dwarf Hedge'	1-2	
Taxus cuspidata	1-2	
Taxus cuspidata 'Adams'	1-2	Because of loose habit of growth, little damage
Taxus cuspidata 'Aristocrat'	2-3	
Taxus cuspidata 'Aurescens'	1	Small plants
Taxus cuspidata 'Capitata'	2-3	Large plants
Taxus cuspidata 'Densa'	1	
Taxus cuspidata 'Expansa'	2-3	Large plants
Taxus cuspidata 'Hiti'	3-4	Large plants
Taxus cuspidata 'Intermedia'	1-2	Large plants
Taxus cuspidata 'Midget'	1-2	

*1=Essentially no damage or recovery nearly complete. 2=Slight damage—some spreading or bending of branches still apparent. 3=Moderate damage—centers of plants open. 4=Severe damage—often broken branches. Centers open or branches greatly diverging from natural habit of growth. Recovery doubtful without extensive pruning.

†Figures in bold face indicate this type of injury more prevalent.

TABLE 5 (Continued).—Snow Damage to Taxus Species, Clones, and Cultivars, Ohio Agricultural Research and Development Center, Wooster, Dec. 1, 1974.

Name	Damage Ratings*	Comments
Taxus cuspidata 'Nana'	1-2	Large plants
Taxus cuspidata 'Prostrata'	2-3	Large plants
Taxus cuspidata 'Robusta'	2-3	Center open, large plants
Taxus cuspidata 'Sieboldii'	2	Large plants
Taxus cuspidata 'Thayerae'	2-3	Variable damage; large plants
Taxus hunnewelliana	1-2	Large plants
Taxus hunnewelliana 'Globosa'	2-3	Large plants
Taxus media	2-3	Variable damage; large plants
Taxus media 'Amherst'	2-3	
Taxus media 'Andorra'	3-4	Center branches widely spread; large plants
Taxus media 'Anthony Wayne'	2-3	
Taxus media 'Berryhill'	1-2	
Taxus media 'Brevicata'	2	Made good recovery; one broken branch; large plants
Taxus media 'Broad Beauty'	1	Small plants
Taxus media 'Brownii'	2-3	Large plants
Taxus media 'Brownhelm'	2-3	
Taxus media 'Burr'	1-2	Small plants
Taxus media 'Chadwick'	1-2	Large plants
Taxus media 'Coleana'	1-2	Large plants
Taxus media 'Cole Type B'	2	Large plants
Taxus media 'Compacta'	3-4	Large plants
Taxus media 'Costich'	3-4	Large plants
Taxus media 'Densiformis'	2-3	Several broken branches
Taxus media 'Donewell'	1	
Taxus media 'Drulia'	2	Large plants
Taxus media 'Dutweilleri'	2-3	Large plants
Taxus media 'Emerald'	1	
Taxus media 'Everlow'	1	Small plants
Taxus media 'Fairview'	2	
Taxus media 'Flemer'	1-2	Female plants less damaged than male; large plants
Taxus media 'Flushing'	1-2	
Taxus media 'Grandifolia'	1	
Taxus media 'Green Candle'	3-4	
Taxus media 'Green Mountain'	2	
Taxus media 'Halloriana'	2	
Taxus media 'Hatfieldii'	1-3	Variable damage; most typical Hatfield plants rate 1-2
Taxus media 'Hatfield No. 2'	2-3	Large plants
Taxus media 'Hatfield No. 6'	2-3	Large plants
Taxus media 'Hatfield No. 18'	2-3	Large plants
Taxus media 'Hatfield No. 19'	2	Large plants
Taxus media 'Hatfield No. 23'	1-3	Large plants
Taxus media 'Henryi'	1	Large plants
Taxus media 'Hicksii'	3-4	Large plants
Taxus media 'Hill'	1-2	Large plants
Taxus media 'Hoogendoorn'	2-3	
Taxus media 'Kelseyi'	2-3	Large plants
Taxus media 'Kobel'	2-3	Some broken branches
Taxus media 'L. C. Bobbink'	1-2	Small plants
Taxus media 'Lodi'	2	
Taxus media 'Mitiska Upright'	1-2	
Taxus media 'Moon'	3-4	Large plants
Taxus media 'Natorp'	1	Large plants
Taxus media 'Newport'	1	Small plants
Taxus media 'Ohio Globe'	1-2	
Taxus media 'Peterson'	1-2	Small plants
Taxus media 'Pilaris'	3	
Taxus media 'Pyramidalis'	2-3	
Taxus media 'Robusta'	2	
Taxus media 'Roseco'	2	Large plants
Taxus media 'Runyan'	1-2	Large plants
Taxus media 'Sebian'	1-2	Large plants
Taxus media 'Sentinalis'	2-3	
Taxus media 'Stovekenii'	3-4	Large plants; badly pulled apart; doubtful recovery without extensive pruning
Taxus media 'Stricta'	3	
Taxus media 'Totem'	3-4	Plants badly pulled apart
Taxus media 'Vermeulen'	2-3	Large plants
Taxus media 'Viridis'	1-2	
Taxus media 'Wardii'	1	Large plants
Taxus media 'Wellesleyana'	2-3	Large plants
Taxus media 'Wilsonii'	2-3	Large plants

*1=Essentially no damage or recovery nearly complete. 2=Slight damage—some spreading or bending of branches still apparent. 3=Moderate damage—centers of plants open. 4=Severe damage—often broken branches. Centers open or branches greatly diverging from natural habit of growth. Recovery doubtful without extensive pruning.

†Figures in bold face indicate this type of injury more prevalent.

TAXUS SPECIES, CLONES, AND CULTIVARS

The plant names used in this publication follow, in general, the International Code of Nomenclature for Cultivated Plants (2) adopted in the United States in 1959. While most of the names conform, some obviously do not. Time and information were not available to trace the origin or original description, if any, to properly determine whether the plant should be listed as a clone or cultivar and the name listed in single quotes. The code states: "A cultivar name published on or after 1 January, 1959, must . . . be a fancy name, that is, one markedly different from a botanical name in Latin form," and designated by the abbreviation cv. before the cultivar name or enclosing the name in single quotation marks. The code also states that: "a cultivar distributed before 1 January, 1959, under a test number or a plot number, or a cultivar whose name is illegitimate, must be given, as a new name, a fancy name in modern language." This rule has not been followed completely. For example, *Taxus media* 'No. 18' continues to be used and to the best of the authors' knowledge this cultivar is not now in commerce. The code regulates against the use of the same cultivar name within a taxonomic unit. Thus, for example, the use of the cultivar name 'Robusta' should not be used for both *Taxus cuspidata* 'Robusta' and *Taxus media* 'Robusta'. *Taxus cuspidata* 'Robusta' would have priority because of earliest publication. The authors have not, in this publication, attempted to correct all such descriptions. It is noted that Den Ouden (14) lists cultivars 'Columnaris,' 'Erecta,' and 'Prostrata' for both species *Taxus baccata* and *Taxus cuspidata.*

Since the differences between species are as much geographical as morphological, the terms used in describing the cultivars are relative. Broad or short leaves are broad or short in relation to other Yew leaves. While the authors would prefer to give precise dimensions for comparison, it was found to be impractical except where there are a great number of cultivars growing together under similar conditions. Even under such circumstances, the linear dimensions of the plant parts will vary with the kind of season and even more with the age of the plant. The latter factor has been especially apparent in some of the plants under observation in the Secrest Arboretum, which were rather dwarf and slow-growing for 5 or more years. Then, when well established, they made more growth each year than in the entire 5 seasons of slow growth. The linear dimensions, the amount of seed set, and even the habit of growth were so changed that the donor was often unable to recognize the plants.

Descriptions based on nursery-grown plants are subject to two primary sources of error: first, the cultivar described and offered for sale may not be true to name; second, the described form may be the result of training in the nursery row rather than the true habit of the selection. Another source of error in naming plants is the general lack of knowledge of the rules for naming plants and of the level of the taxon to be named. In this study, no error was found at the generic level. Errors were common at the specific level, especially between the species *T. media* and *T. cuspidata,* although many growers ignored the species, using only the genus and cultivar names, *e.g., "Taxus brownii".*

The clonal concept is foreign to some nurserymen, who select groups of plants toward an ideal with little regard for names or descriptions. This has been well illustrated by the many selections of *"intermedia"* which have been offered as "improvements" on the original clone.

The avoidance of such error can be achieved by following the recommendation of the *International Code of Nomenclature for Cultivated Plants* that a Register of Yew Names of national or international scope be established. This agency acts as a clearing-house for all new names, and is responsible for the proper registration, description, and naming of plants. The preservation of plant materials, herbarium specimens, and records is involved.

Taxus baccata L.
English Yew

This species is a tree to 60 feet high, with thick, short, branching trunk and reddish bark which scales from the trunk and larger branches in thin flakes or long strips; or a shrub under adverse conditions or when propagated from lateral or plagiotropic branches. Mature branchlets or twigs, slender, greenish, scattered alternate arrangement, often close together near the apex of the previous season's growth, forming a pseudo whorl.

Leaves linear, tapering or gradually acuminate, flat, about 1 inch long, dark lustrous green above, with two pale green stomate bands below; midrib prominent above; petiole short and greenish. The leaves are attached spirally by decurrent bases, but take a two-ranked position in a single plane, forming flat sprays except on the leaders of excurrent plants and in some cultivars as in Irish English Yew, which characteristically has the leaves arranged radially.

The winter buds are ovate, rather small, with persistent, blunt, thin scales which have no prominent ridge or keel.

The seed of the English Yew is broad ellipsoid, dark brown, about one-fourth inch long, and usually 2-angled at the apex. The aril or cupped disc which covers the seed is open at the end and usually exceeds

the length of the seed. The aril is scarlet or bright red beneath a waxy bloom which imparts a crimson appearance, except in the cv. Yellow-Berry English Yew.

The English Yew is native to the British Isles, most of Europe, and the mountains of adjacent parts of Asia and Africa, according to Rehder (33). In America, the species is not hardy north of Kentucky and Delaware, except on Long Island and the north shore of Long Island Sound. It is represented in the Living Herbarium of Taxus by some of the hardier cultivars, of which the cv. Spreading English Yew appears to be the most hardy.

***Taxus baccata* 'Adpressa'** Carriere

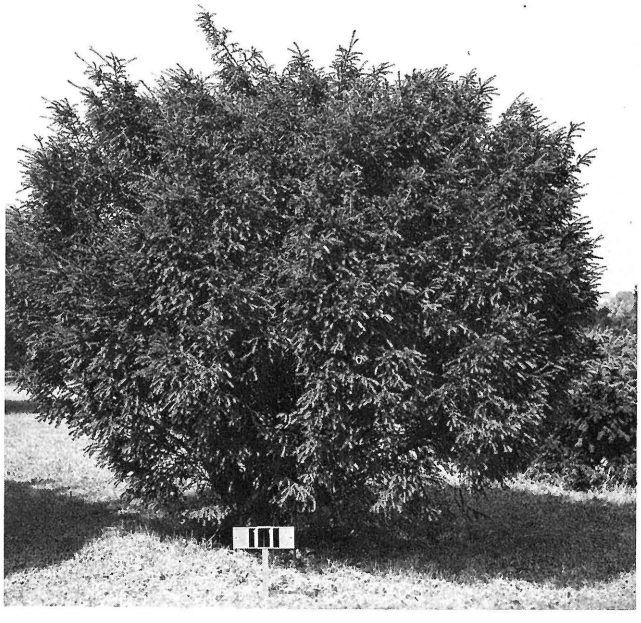
T. adpressa Gordon; *T. tardiva* Lawson; *T. brevifolia* Hort. not Nuttall; *T. baccata* var. *adpressa* Carriere

According to Wilson (35), this cultivar is a seedling of *T. baccata* first grown in the Dickson Nursery at Chester, England, about 1828.

The dark green, abruptly pointed or mucronulate short leaves, less than one-half inch long, make this female cultivar unique and impossible to confuse with any other. The leaves are broad ovate to oblong, two-ranked in one plane, and so uniform in length the sprays appear ribbon-like.

The twigs are bright to olive green and moderately slow in growth, often somewhat pendulous. According to Dallimore (12), this shrub "never affects a central leader."

The winter buds are globose with thin obtuse scales. The aril is light red, about 9 mm. wide by 7 mm. long, the cup enclosing only two-thirds to three-fourths of the seed; the large opening is angled. The nutlet is short and globular, mostly 3-4 angled, very dark brown when mature.



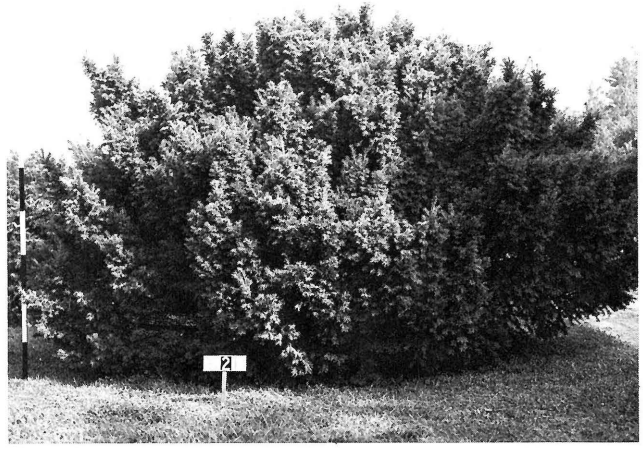
***Taxus baccata* 'Adpressa'**

This cultivar, represented in the Secrest Arboretum by group 11 (A, C), was obtained from Lakewood Nursery, Lakewood, Ohio.

***Taxus baccata* 'Aurea'** Carriere

T. baccata var. *aurea* Bailey; *T. baccata* var. *elvastonensis* Beissner; *T. baccata aurescens* Hort.; *T. baccata elegantissima* Hort. not Beissner

The Golden English Yews are not a clone, having been widely grown from seed to avoid the "one-sided" growth of vegetatively propagated plants.



***Taxus baccata* 'Aurea'**

Therefore, considerable latitude is allowed in growth habit and leaf characteristics as long as the undersides and margins of the leaves are bright golden yellow. This color fades to yellowish white by late autumn; the leaves are green the second season.

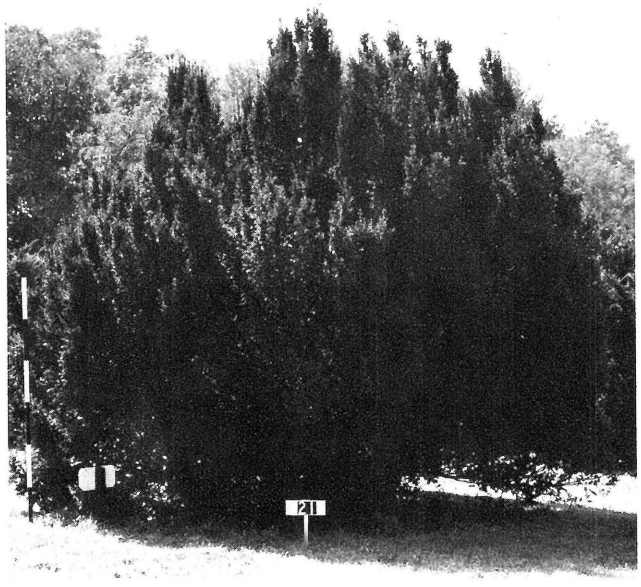
This popular type with American nurserymen is quite compact and erect while young, making dense pyramids or globes, becoming broad conical and less dense with age.

The leaves are straight, arranged spirally or pectinate in a narrow "V" and somewhat appressed, showing the bright yellow undersides to good advantage. Both sexes are offered in this form.

This cultivar is more hardy than the species, but frequently shows some winter damage on the southwest side at Wooster, Ohio. It is represented in the Secrest Arboretum by groups 1 (D) and 2 (B). Plants of 2 (B) (photo) were obtained from Lakewood Nursery, Lakewood, Ohio.

***Taxus baccata* 'Compacta'** Beissner

This cultivar originated in the Den Ouden Nursery, Holland, about 1910, according to Krussmann (26). He states that Beissner's description is inaccu-



Taxus baccata 'Compacta'

Taxus baccata 'Dovastoniana'

rate because it was of a young plant about 18 inches high. The plant is not dwarf and, like most Yews, grows more rapidly after it attains some size.

It is a dense, fastigiate, compact, male cultivar of broad oval or conical form. The branchlets are ascending or somewhat appressed, abundant on previous season's and older growth, 2 to 3 inches long.

The leaves are radially arranged on the branches and upper branchlets. The leaves are short, not over five-eighths of an inch, narrow and somewhat curved, dark glossy green above, lighter below, with a narrow dark green midrib.

Not as winter hardy as the cv. Broom English Yew, it has shown some winterburn on the south side almost every year. The specimens in group 21 (E) in the Secrest Arboretum were propagated from plants imported from Blauw Nurseries, Boskoop, Holland, about 1917. Plants of this cultivar were obtained from F. & F. Nurseries, Springfield, N.J.

Taxus baccata 'Dovastoniana'

Taxus baccata dovastoniana Leighton; *T. baccata dovastonii* Lawson; *T. baccata dovastoni* Loudon; *T. imperialis* Hort. ex Hoopes; *T. baccata horizontalis* Hort.; *T. baccata pendula* Hort.

This cultivar was first described in 1838 by Loudon (28) as "Westfelton Yew". The original tree was planted about 1777 at Westfelton, England. It is monoecious, having one female branch.

The cultivar differs from the English Yew only in that the branchlets are pendulous from horizontal and terminally ascending branches in much the same habit of an old Norway Spruce. Krussmann (26) considers this cultivar "one of the most decorative of all conifers." It was once quite popular in the trade, and many large specimens can be found from Newport, R. I., southward. This cultivar, represented in the Secrest Arboretum by group 20 (C), was obtained from the Kallay Bros. Co., Painesville, Ohio.

Taxus baccata 'Erecta' Loudon

T. baccata pyramidalis Carriere; *T. baccata fastigiata* Hort. not Loudon

This old male cultivar was described as a seedling of the cv. Irish English Yew by Loudon (28) in 1838. It was well known in the trade in America by

Taxus baccata 'Erecta'

1868, with extensive plantings at the Parsons Nursery, Flushing, L. I.

The branches grow erect, with fastigiate branchlets and twigs forming small spires in the top of old plants. Young plants are narrow columnar, becoming broad ovate and finally hemispherical with age.

The leaves are dark glossy green above, lighter with somewhat glaucous bands below; less than three-fourths of an inch long, straight and arranged flat in a single plane; more narrow and finer textured than those of the species.

This cultivar is among the hardier of the English Yews, but has shown some winter damage in severe winters in the Secrest Arboretum, where it is represented by group 10 (A, D). Plants of this cultivar were obtained from the Siebenthaler Co., Dayton, Ohio.

***Taxus baccata* 'Expansa'** Carriere

T. baccata var. *procumbens* Kent; *T. baccata* var. *expansa* Bailey; *T. baccata dovastoni* Hort. not Leighton

There is considerable difference in the descriptions of this cultivar by various authors, due perhaps to variations in propagation, training, and age. All agree that the cultivar is quite distinct with large, dark green, falcate leaves 1 to 1½ inches long arranged pectinately in a deep "V" exposing the contrasting light green undersides rather conspicuously.

The cultivar is female with light crops of early maturing seed. Aril is crimson, subglobose, large, only slightly exceeding the seed. Nutlet is easily extracted, red chestnut brown, broad ovate, obtuse, two-angled, large, glossy; hilum large and ovate.

***Taxus baccata* 'Expansa'**

The specimens in group 39 (A, C) in the Secrest Arboretum were trained as globes as received. The branches were horizontal or somewhat pendulous, little divided, and somewhat in layers or sprays. Growth was moderately vigorous. As the plants approached 4 feet in height, growth became vigorous and more ascending. The globe shape has not been lost with age. Plants of this accession were obtained from C. R. Runyan, Spring Grove Cemetery, Cincinnati, Ohio.

***Taxus baccata* 'Fastigiata Aurea'**

Taxus baccata fastigiata aurea Senecl. 1868

The cultivar *Taxus baccata* 'Fastigiata' was discovered as a seedling on the mountains above Florence Court, county of Fermanagh, Ireland, before 1760, according to Dallimore (12). A fastigiate tree, to 25 feet, narrow columnar when young, becoming ovate with age. The branchlets are short, slow-growing and appressed, with radial leaves, giving the uppermost branches a spire or pinnacle effect. The leaves are larger and more cuspid than in the species, dark green and somewhat glaucous. Seeds of the cv. Fastigiata are larger than those of the species, mostly 3-4 angled. The cv. Fastigiata is the seed parent of the cultivars *Taxus baccata* 'Erecta' and *Taxus media* 'Hatfieldii'.

The cultivar *Taxus baccata* 'Fastigiata Aurea' is similar to cv. Fastigiata but of much slower growth and more winter-hardy. The young growth and leaves are deep golden yellow.

An old specimen of the female cv. Fastigiata Aurea exists in the old Taxus section of the Secrest Arboretum. It was obtained from the old McBeth Nursery and planted in 1931.

***Taxus baccata* 'Glauca'** Carriere

T. baccata var. *glauca* Hoopes; *T. baccata pyramidalis glauca* Hort.; *T. baccata* 'Blue Jack' Hort. ex Gibbs; *T. baccata* 'Blue John' Hort.

The plants in group 19 (A, D) which represent this cultivar at Wooster are quite hardy. The parent plants were imported from England before 1914 to the Caulby estate, now the City Hall of Wickliffe, Ohio, and are still in good condition.

This male cultivar is "a very vigorous kind, with leaves dark green above, and bluish or glaucous gray on the under part, and with the bark on the young shoots of a rusty brown color," according to Gordon (18). The habit of young plants is strongly ascending, almost fastigiate, and easily trained columnar. With age they become more spreading and ovate. The terminal buds of the vigorous branchlets are exceptionally large, as are the abundant pollen cones in April. Plants of this accession were obtained from M. Sebian, Painesville, Ohio.

Taxus baccata 'Glauca'

Taxus baccata 'Michelii' Slavin

T. baccata mitchelli Hort.; *T. baccata micheli* Hort.; *T. baccata ericoides* Hort. not Pilger

The American source of cv. Michelii English Yew has been the Barbier Nursery of Orleans, France, in two importations. The first was made to the Rochester Park Department in 1911, the second to F. & F. Nurseries in Springfield, N. J., 5 to 7 years later.

This cultivar forms a low, dense, globular, or spreading shrub like a miniature cv. Repandens. Branches ascending or arching with decurved apex. Twigs are very slender, olive green, and slow-growing, 1 to 3 inches annually, to 6 inches annually on vigorous main shoots; winter buds ovate and prominent.

Leaves strongly falcate and recurved, exposing undersides; slender, tapering to an acute apex; bright green above, turning bronze in winter when exposed to sun, olive green or yellowish below, with midrib and margin mere lines; arranged in a broad "V" on upper side of twig, close set, and pointing forward at an angle of 45° from the twig, never two-ranked in a horizontal plane. A female cultivar but fruits sparingly.

In the Secrest Arboretum, group 12 (B, D, E), it has been somewhat less hardy than cv. Repandens and about half as vigorous. It improves in hardiness and vigor with age. Plants of this cultivar were obtained from the Siebenthaler Co., Dayton, Ohio.

Taxus baccata 'Nigra' Paul

T. cuspidata nigra Hort.; *T. media nigra* Hort.

The origin of this cultivar is probably European, but it was introduced by Robert T. Brown of Cottage Gardens, Queens, L. I., before 1928. This early date and its tenderness would point toward European import or perhaps the tender hybrids which Hatfield sent to Long Island about 10 years earlier.

This male cultivar is a globose or spreading shrub with erect or ascending branches of moderate growth. Twigs slender, olive green, turning reddish in winter sun. Tips of vigorous twigs decurved.

Leaves slender, to 1¼ inches, tapering and acuminate, dark glossy green with prominent midrib above, becoming reddish or purplish in winter sun.

Taxus baccata 'Michelii'

Taxus baccata 'Nigra'

Underside of leaves yellowish green, with midrib and green margins mere lines, arranged pectinate or scattered on upper side of twigs but irregularly curved, arched, and twisted to give a distinct "curly" effect.

Pollen cones abundant, large, and the first to reach anthesis. These plants in the Secrest Arboretum are heavily worked by bees as a source of early pollen. The foliage is somewhat tender and subject to some winter burn. Plants in these accessions were obtained from M. Sebian, Painesville, Ohio, (25D) and Fairview Evergreen Nurseries, Fairview, Pa., (66A) (photo).

***Taxus baccata* 'Overeynderi'** Krussman

T. baccata erecta overeynderi Den Ouden (13); *T. baccata overeynderi* Hort.

This male cultivar was grown from seed of the cv. *T. b.* 'Fastigiata' about 1850 by C. G. Overeynder in Boskoop, Holland. It is commonly compared with the cv. Erecta which it resembles, but is smaller in twig size and growth. The leaves are shorter and finer in texture, more likely to be damaged in winter. The growth is more narrow and erect than cv. Compact English Yew.

This cultivar is represented in the Secrest Arboretum by group 58 (B).

***Taxus baccata* 'Overeynderi'**

***Taxus baccata* 'Repandens'**

***Taxus baccata* 'Repandens'** Parsons

T. baccata var. *repandens* Parsons ex Bailey; *T. baccata repanda* Hort.; *T. baccata imperialis* Hort. not Beissner

The origin of this cultivar is unknown other than in America. It is represented in the Secrest Arboretum by group 3 (C, D, E).

This hardiest English Yew is a wide-spreading shrub to 10 feet high by 30 feet wide, but is usually a lower, wide, radially spreading plant two to three times as broad as high.

Branchlets green to olive green and horizontal; or, if ascending, with decurved tips and becoming horizontal the following season. In the shade it grows almost creeping or procumbent.

The leaves are slender, long tapering, or acuminate and somewhat falcate; arranged in a narrow "V" or pectinate on upper half of the twig, exposing the light green underside of the leaf. Upper surface of the leaves dark green to bluish green with a prominent midrib. Winter buds broad ovate to globose, with ridged or keeled bud scales.

A female cultivar with slightly flattened two-angled globose seeds. The aril exceeds the seed by one-third. Seed scattered and scarce. Plants of this accession were obtained from C. E. Kern, Wyoming Nurseries, Wyoming, Ohio.

***Taxus baccata* 'Washingtonii'**

T. baccata var. washingtonii Beissn.; *T. canadensis* washingtonii Hort.

According to Krussmann (26), this cultivar is female in Europe. However, most of the old arboretum specimens in America are male. The large plant in the old Taxus section of the Secrest Arboretum is female.

This yellow cultivar is less showy than *Taxus baccata* 'Aurea', the leaves being more green, with the yellow confined to the tips and narrow margins of the

strongly falcate leaves. The texture of the leaves is somewhat finer, accented by their falcate shape and pectinate arrangement in a broad "V". The yellow color disappears the second season from both twigs and leaves; those in the shade develop little yellow color. The growth habit is spreading and rounded. Old plants observed have the centers well filled with ascending branches.

The plant in the old Taxus section of the Secrest Arboretum was obtained from the Carr Nursery, Yellow Springs, Ohio, and planted in 1929.

Taxus canadensis Marshall
Canada Yew

T. baccata var. *procumbens* Loudon; *T. baccata* var. *canadensis* Gray; *T. baccata* var. *minor* Michaux; *T. minor* Britton; *T. baccata* subsp. *canadensis* Pilger; *T. canadensis wilsoni* Hort.

The range of *Taxus canadensis* is found from Newfoundland to Virginia and west to Iowa and Manitoba. It is probably the hardiest of all Yews, but discolors severely and may even be killed when exposed to winter sun. Useful for ground cover in deep shade, and for wildlife cover in natural plantings.

A straggling evergreen shrub to 5 feet with many ascending branches. Main stems prostrate and rooting, or ascending. Mature branchlets olive green to reddish brown, changing to brown the second season.

Leaves to three-fourths of an inch, shorter near tips of twigs, abruptly and sharply pointed, margins slightly revolute, midrib prominent on both surfaces. Leaf color is dark glossy green above, changing to brick red to purple when exposed to winter sun. Stomate bands lighter, about twice as wide as the green margins, petiole very short. Leaves arranged pectinately in flat plane on horizontal branches and in the shade, to a deep "V" and falcate on ascending branchlets.

Winter buds small, ovate, or pyramidal, with keeled persistent scales. Lateral vegetative buds appear square in cross section or from an end view.

Flowers monoecious, with female below on each twig, somewhat smaller than other species. The seed ripens irregularly in August and September, somewhat ahead of other species; aril orange to scarlet, subglobose, small, 8 mm. wide by 6 mm. long, slightly exceeding the nutlet. The nutlet is small, broad, ovate, 4 mm. by 5 mm., with blunt or mucronate apex, mostly two-angled; hilum small, ovate, depressed with puckered margin on fluted neck. The surface is dull brown and finely reticulate. This species is represented by group 96 (E) in the Secrest Arboretum. Plants of this species were obtained from the Berryhill Nursery Co., Springfield, Ohio.

Taxus canadensis

***Taxus canadensis* 'Dwarf Hedge'**

***Taxus canadensis* 'Dwarf Hedge'**

Taxus canadensis stricta Bailey; *T. canadensis densa* Hort.; *T. canadensis* var. *stricta*

This cultivar is no longer listed in the trade, even by Wyman's Framingham Nurseries, Framingham, Mass., which originated and introduced the cultivar about 1915. Bailey (3) describes this as a "dwarf stiffish form," and Rehder (33) as having "stiff upright branches." The plants in group 87 (A) of the Living Herbarium of Taxus, obtained from Berryhill Nursery Co., Springfield, Ohio, are more erect and compact than the species, the ascending twigs almost vertical with nodding ends. The growth rate is less and the secondary twigs more abundant; otherwise it is like the species.

Taxus cuspidata

Taxus cuspidata Siebold and Zuccarini
Japanese Yew

T. baccata Thunburg; *T. baccata cuspidata* Carriere; *T. baccata sieboldi* Hatfield; *T. baccata* subsp. *cuspidata* Pilger; *T. cuspidata sieboldi* Hort.; *T. cuspidata expansa* Rehder; *T. cuspidata capitata* Hort.

According to Wilson (35), this species was brought to America from Japan in 1862 by Dr. George R. Hall, who released it to the nursery trade through Parsons and Co., Flushing L. I. Parsons and Co. later imported it direct from Japan, as did several other companies.

A tree to 50 feet, with spreading or ascending branches, or a spreading, rounded to vase-shaped shrub when propagated from lateral or plagiotropic branches. (See description for *Taxus cuspidata* 'Capitata', page 24.) Bark reddish to dark brown, scaling from trunk and larger branches or falling in long strips from older trees.

Twigs slender, yellowish green, or reddish in winter when exposed to the sun, turning brown the second season. Winter buds ovate with persistent, ovate, keeled scales. The basal scales are triangular ovate.

Leaves dull dark green above, about 2.5 cm. long, linear and abruptly cuspid, not tapering and acute as in *T. baccata*. Midrib prominent above, a narrow line or almost invisible below. The stomate bands yellowish green, turning almost yellow when exposed to winter sun, about twice as wide as green margins of leaf. Petiole short but distinct, yellowish.

The plants are dioecious with a propensity for bearing heavy crops of seed which mature somewhat later than the other species. The aril is usually globular, about 10 mm. in diameter, and exceeding the nutlet. The opening is circular and as large as the seed, the interior often 3-4 angled. Nutlet brown, broad, ovate, 5 mm. by 6 mm., with obtuse apex mostly 3-4 angled. Hilum tan, slightly depressed, usually deltoid or squarish with margin fluted or puckered.

As commonly grown in the trade, a spreading shrub, it is represented by groups 7 (B) (photo) and 9 (B) in the Secrest Arboretum. Plants obtained from Carl E. Kern, Wyoming, Ohio.

***Taxus cuspidata* 'Adams'**

T. cuspidata columnaris Chadwick; *T. media columnaris* Hort.; *T. columnaris adamsi* Hort.; *T. cuspidata "Adams spreaders"* Hort.

The origin of this vigorous male cultivar is unknown, but it has been widely sold by the Adams Nursery of Springfield, Mass. It is a favorite with many nurserymen because it makes up a salable columnar plant rather quickly when sheared heavily. The habit is excurrent with a propensity for developing several leaders. Lateral branches are ascending at about 45°. The exposed twigs turn orange to red in winter and brown the second season.

Leaves spirally scattered on leaders and well spaced in deep "V" on strong lateral twigs, exposing the broad yellow-green stomate bands; close set in a broad "V" on secondary branchlets. The dark green color becomes a characteristic dark olive green in winter.

The plants in groups 36 (B) and 73 (B, D) (photo) in the Secrest Arboretum were received from Carl E. Kern, Wyoming, Ohio, as narrow columns and maintained this habit about 5 years until 1947. By 1954, however, the plants were broader than high. With the several good fastigiate yews on the market,

***Taxus cuspidata* 'Adams'**

this cultivar should not be used where a columnar plant is needed in the landscape.

***Taxus cuspidata* 'Aristocrat'**

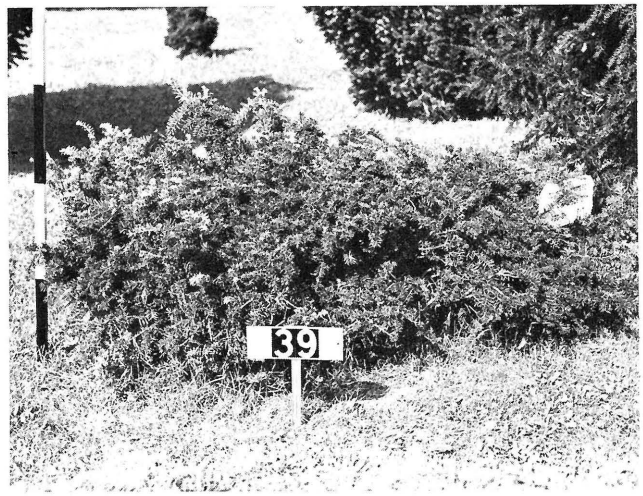
This cultivar was marketed in 1957 by Emil R. Danegger of Milford, Del., who was impressed by its fern-like beauty as a small plant. This results from the uniformity of the abundant secondary branching on lightly sheared young plants and the slender twigs with nodding or decurved tips. The leaves are graduated, long to short, the length of the current season's growth, and held in a deep "V". Specimens are upright spreading in growth habit, with a tendency to open up with age unless sheared. This female cultivar is represented in the Secrest Arboretum by group 56 (A).

***Taxus cuspidata* 'Aristocrat'**

***Taxus cuspidata* 'Aurescens'** Rehder

T. tardiva aurea Hort.; *T. cuspidata tardiva aurea* Hort.; *T. cuspidata* var. *aurescens* Rehder; *T. cuspidata nana aurea* Hort. ex Wyman

Rehder (31) gives as a source ". . . Japanese dealers who offer it as *Taxus tardiva* yellow-variegated." According to Rehder (31), this female cultivar is the first variegated form of the Japanese Yew in cultivation. It is a low, compact, very slow-growing shrub with the young terminal leaves bright golden yellow, changing to green with age; those on the tips may remain yellow all winter. Leaves thick, leathery, and radiating from twig much like those of *T. cuspidata* 'Densa', but not as wide.



***Taxus cuspidata* 'Aurescens'**

Twigs are orange-red, turning olive green with the leaves, and brown the second year. Plants in group 39 (D) in the Secrest Arboretum were received from the Tingle Nursery Co., Pittsville, Md.

***Taxus cuspidata* 'Capitata'**

As discussed under *Taxus cuspidata,* the species may be upright with ascending, spreading branches, or lower, wide-spreading bush of rounded or vase-shaped form, depending on the method of propagation or the type of wood selected for cuttings. Rehder (33) regarded the excurrent tree as the true or type plant of the Japanese Yew, *T. cuspidata,* and proposed the name *expansa* for the spreading plants.

Of great concern to the propagator as well as to the taxonomist is the habit of growth of scions or cut-

***Taxus cuspidata* 'Capitata'**

tings used in the vegetative propagation of yews, because these branches continue in the same habit of growth as if they were still attached to the parent plant. The problem has commercial aspects which cannot be ignored, because it is most important in executing a landscape planting that the plant supplied be not only "true to name" but also of the desired habit of growth. An example of the nurseryman's solution to the problem involved is that of labeling the excurrent plants of the Japanese Yew, whether from seed or orthotropic cuttings, *Taxus cuspidata* 'Capitata', with the name *Taxus cuspidata* or *Taxus cuspidata* 'Expansa' reserved for the spreading plants propagated from lateral or plagiotropic branches.

The plant of *Taxus cuspidata* 'Capitata' represented in the Secrest Arboretum by group 15 (A) was obtained from Lakewood Nursery, Lakewood, Ohio.

***Taxus cuspidata* 'Densa'** Rehder

T. baccata subsp. *globosa,* f. *tardiva* Matsumura

This female cultivar was imported from Japan by Parsons Nursery, Flushing, L. I. Plants were sent to the Arnold Arboretum about 1900 under the name *T. cuspidata* "Dwarf Form". Rehder (33) described this cultivar in 1916. The plants in group 18 (C, E) in the Secrest Arboretum were obtained from F. & F. Nurseries, Springfield, N. J., and were propagated from the plants at the Arnold Arboretum.

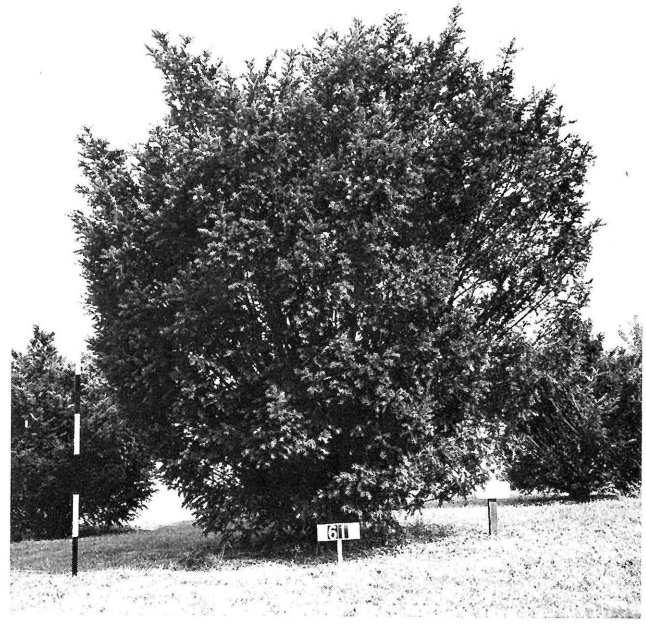
This low, compact, slow-growing cultivar is irregularly globular in form as a young plant, becoming hemispherical with age. Annual growth under the best conditions rarely exceeds 8 inches and is usually much less, with many secondary branchlets on previous season's and older wood. The bark on the twigs is thick, soft, and leathery.

***Taxus cuspidata* 'Densa'**

Leaves thick, broad, leathery, and dark green above, with cuspid to mucronate apex. Stomate bands below very broad, the margins and midvein mere lines. The leaves are thick set, mostly radial on the short branchlets, to a broad "V" on ascending twigs. The aril flattened to subglobose, scarcely exceeding the nutlet. Nutlet dark brown, wrinkled, globose, slightly compressed, and weakly 2-angled.

***Taxus cuspidata* 'Expansa'** Rehder

This cultivar designated by Rehder (33) as *T. cuspidata* 'Expansa' is the spreading form of *Taxus cuspidata* propagated from lateral or plagiotropic branches. The type is discussed under *T. cuspidata* and *T. cuspidata* 'Capitata'.



***Taxus cuspidata* 'Hiti'**

***Taxus cuspidata* 'Hiti'** Hort.

This old cultivar has not had general acceptance in the trade. It was selected from a block of *T. cuspidata* seedlings at the Hiti Nursery, Pomfret, Conn., about 1925. In the Secrest Arboretum it is represented by group 61 (B), which were narrow columns when received but are now dense vasiform plants. Plants were obtained from C. E. Kern, Wyoming, Ohio.

This male cultivar is a broad pyramidal to a vasiform shrub of moderately rapid growth. Branches strongly ascending, almost fastigiate, with a characteristic whorl of strong secondary branches at the apex of the previous season's growth. Winter buds large, ovate, sometimes stalked, clustered near apex of twig. Pollen cones large, sparsely scattered. Leaves dark green above, in a broad "V" on horizontal twigs,

to a deep narrow "V" on ascending branches, exposing the lighter yellowish green stomate bands below; mostly exceeding 1 inch, broad linear, cuspid, thick-set on secondary twigs. A few 'Hiti Upright', 'Hiti Columnar', etc. cultivars were later sold, but none are presently in the trade.

***Taxus cuspidata* 'Intermedia'** Kumlien

T. intermedia Hort.; *T. cuspidata intermedia upright* Hort.; *T. cuspidata intermedia capitata* Hort.

This cultivar was probably selected and named by Robert Brown of Cottage Gardens, Queens, L. I. The name was intended to convey the habit of growth intermediate between a shrubby *T. cuspidata* and *T. cuspidata* 'Nana'.

This cultivar, of both sexes, forms a dense, low-growing, globular shrub while young, almost identical with its parent, the cv. Nana. With increasing age and size, the growth rate increases until it is more than twice as rapid as that of 'Nana', but the form remains globular, as the cv. Nana parent. Growth begins 1 week to 10 days ahead of cv. Nana.

Twigs slender and turning brown the second season. Leaves dark glossy green, broad, thick, and leathery, mostly radiating around the twig, with the older needles at the base of the mature twig often more than twice as long as the apical leaves, the intervening leaves graduated to give a tapered effect.

This cultivar bears medium crops of rather late-maturing seed. Aril globose to subglobose, 10 mm. by 8 mm., slightly exceeding the nutlet; opening elliptical, as large as the seed or a thin slit. Nutlet dark brown, small, 4 mm. by 5 mm., very broad ovate, apex obtuse, 2-4 angled, but mostly 2-angled.

***Taxus cuspidata* 'Intermedia'**

Plants in group 51 (C) (photo) in the Secrest Arboretum were obtained from the Tingle Nursery Co., Pittsville, Md. It is quite winter-hardy, but is often damaged by spring frosts because it begins growth so much ahead of other yews.

***Taxus cuspidata* 'Midget'**

***Taxus cuspidata* 'Midget'**

T. cuspidata 'Bobbink' Chad.; *T. cuspidata* 'Tsugafolia' Hort.

This dwarf female cultivar was discovered among the *T. cuspidata* plants in the Bobbink and Atkins Nursery, East Rutherford, N. J. The rate of growth is very slow. Four to 6-inch 1-year rooted cuttings in 1942 were 26-inch globes by 1954 and under 4 feet in 1975. This cultivar is represented by group 35 (D) in the Secrest Arboretum.

Branchlets green in shade to bright red-orange in sun, turning brown the second season. Winter buds and bud scales as in the species, but much smaller, as are all parts of the plant. Leaves short, less than one-half inch, linear cuspidate to acicular, close-set and spirally radiating to almost opposite or paired. Bright green and glossy in summer, becoming reddish in winter sun.

The aril is orange-red, a shallow cap or torus 9 mm. by 5 mm., covering one-half of the seed, opening clasping the nutlet; the base deeply depressed; somewhat late in maturing. Nutlet small, 3 mm. by 4 mm., subglobose, acute, weakly 2-angled, light brown, glaucous where exposed and wrinkled. Hilum small, depressed, and ovate.

***Taxus cuspidata* 'Nana'** Rehder

T. brevifolia Hort. not Nuttall; *T. cuspidata brevifolia* Hort.; *T. cuspidata* var. *compacta* Bean; *T. cuspidata* f. *nana* Rehder

***Taxus cuspidata* 'Nana'**

This cultivar is one of the oldest of the Japanese Yews, originating in Japan. Two general types are in the trade; one, faster growing with lighter leaves, forms a loose, hemispherical plant with age; the second is more dense with broader, darker green, leathery leaves and more ascending branches.

Excurrent plants are rare; the usual form is a dense wide-spreading shrub with spreading ascending branches covered with short branchlets.

The twigs are stouter than the type, with a soft, leathery, or coriaceous, wrinkled bark.

Leaves a dull dark green, broader and thicker than the species, arranged radially on the secondary branchlets and in a deep "V" on the upper side of ascending branches.

T. cuspidata 'Nana' is represented in the Secrest Arboretum by groups 8 (C, D) and 24 (A, C) (photo). Plants in group 24 were obtained from the Cole Nursery Co., Painesville, Ohio.

***Taxus cuspidata* 'Prostrata'** Chadwick

T. cuspidata 'Flat Type' Hort.

This male cultivar originated as a seedling at the Evergreen Nursery Co., South Wilton, Conn., before 1937.

A very vigorous, wide-spreading, and somewhat open-centered shrub, 10 feet high by 24 feet wide, and making about 18 inches of new growth annually. The branches are horizontal to slightly ascending with decurved tips.

Leaves dark green above, yellow green or light olive green below; arranged pectinately flat in one plane on horizontal and shaded branchlets, and in a narrow "V" on ascending branches, which exposes the broad stomate bands, imparting a yellowish color to the plants in winter. The yellowish winter color is increased by the abundant crops of large, prominent pollen cones.

The winter-hardy plants in group 14 (C) of the Secrest Arboretum were obtained from the Siebenthaler Co., Dayton, Ohio.

***Taxus cuspidata* 'Prostrata'**

***Taxus cuspidata* 'Robusta'**

T. cuspidata robusta Chadwick; *T. cuspidata columnaris* Hort.; *T. "Globe Shape"* Hort.

This cultivar has been in the nursery trade for many years. It was probably introduced by the Par-

***Taxus cuspidata* 'Robusta'**

sons Nursery, Flushing, L. I., which sold sheared specimens as *T. cuspidata columnaris.* The Evergreen Nursery Co., South Wilton, Conn., sold the erect growing plants under the same name. Spreading plants were sheared and sold as *T. "globe shape".* The plants in the Secrest Arboretum, group 5 (E) propagated from plants from the latter group, were obtained from the Siebenthaler Co., Dayton, Ohio.

A vigorous female cultivar growing as much as 2 feet per year on the stronger branches. Habit of two sorts: either erect and almost fastigiate when propagated from the near vertical ascending leaders, or spreading plants with well-filled centers when propagated from slightly ascending lateral branches. The latter are easily sheared to globular form.

The leaves are dark green, mostly falcate, arranged in a "V". The seed crops vary from light to medium heavy, the aril crimson, subglobose to oblate, 9 mm. broad by 7 mm. long, equal to or slightly exceeding the nutlet. The opening squarish. Nutlet dark brown, smooth, 4 mm. broad by 5 mm. long, mostly strongly 4-angled.

***Taxus cuspidata* 'Sieboldii'**

***Taxus cuspidata* 'Sieboldii'**

T. baccata sieboldi; T. cuspidata siebold

This cultivar is often considered synonymous with *T. cuspidata,* but plants in the Secrest Arboretum differ from the usual run of this species. Siebold, a German botanist working at Leyde University in Holland, was the first to bring plants of this type from Japan. The plant is a dense, blue-green, vigorous form of both sexes.

This cultivar, represented by group 9 (E) in the Secrest Arboretum, was obtained from the F. & F. Nurseries, Springfield, N. J.

***Taxus cuspidata* 'Thayerae'** Wilson

T. cuspidata form *Thayerae* Wilson; *T. media Thayeri* Hort.; *T. media andersoni* Hort.; *T. cuspidata andersoni* Kumlein

This female cultivar was grown from the seed, probably about 1916 or 1917, of a single plant of *T. cuspidata* by William Anderson, superintendent of the Bayard Thayer estate, South Lancaster, Mass. The cultivar is often erroneously listed in the trade as T. cuspidata 'Andersoni'.

It is a wide-spreading, fast-growing shrub with the center well filled, giving a salable plant 1 year or more ahead of the species. The branches are strongly ascending on small plants, becoming more horizontal with age, the lower branches drooping.

The terminal growth of vigorous branches often shows a sinuate ascending curve with nodding apex, forming a shallow "S". Secondary branches often variously curved and, not rarely, inverted.

The leaves are rather narrow, somewhat tapering, acute, and somewhat falcate; close-set in two-ranked flat planes at almost 90° to the twigs on horizontal or drooping branchlets, or on ascending terminals, wide spaced in a deep pectinate "V", exposing the contrasting olive green of the broad stomate bands, which become almost yellow in winter sun. The leaf margin and midrib below a very narrow line.

This cultivar bears medium crops of somewhat late maturing seed; twin seeds are common. The aril scarlet, large, globose, 10 mm. broad by 11 mm. long, exceeding the nutlet by one-third; opening as large as seed, elliptical or squarish. Nutlet broad

***Taxus cuspidata* 'Thayerae'**

ovate, 4 mm. by 6 mm., brown with glaucous apex when fresh, apex obtuse and 2-angled.

This cultivar is represented in the Secrest Arboretum by groups 17 (C) (photo) and 52 (D), obtained from F. & F. Nurseries, Springfield, N. J., and propagated from plants in the Arnold Arboretum.

Taxus* x *hunnewelliana Rehder
Hunnewell Yew

T. canadensis stricta Hort. not Bailey; *T canadensis compacta* Hort.; *T. media hunnewelliana* Kumlien

This chance hybrid between *T. canadensis* x *cuspidata* was raised from seed of *T. canadensis* about 1900 by T. D. Hatfield, gardener on the Hunnewell estate, Wellesley, Mass., according to Rehder (32). At first regarded as *T. canadensis,* the excurrent plants were being distributed as *"T. canadensis stricta"* as late as 1936. The hybrid nature of these seedlings was recognized in 1923. The formal description was published by Rehder (32) in 1925. Since this name was proposed for all plants of this parentage, as wide a variation of characteristics must be expected as in the case of *T. media* with all of its cultivars.

The plants in the trade are leaderless, vasiform spreading shrubs propagated from side branches and mostly of two sorts. One, a short-leafed, low, dense shrub with strongly ascending branches, is probably from the Arnold Arboretum plant. The second seems to stem from specimen No. 9 in T. D. Hatfield's specimen tree block on the Hunnewell estate. These plants favor the *T. cuspidata* parent, having longer, darker green leaves not as closely set, and the branches more vigorous and less ascending than the former kind.

Taxus hunnewelliana

The Hunnewell Yew is intermediate between its parents. It is more vigorous than *T. canadensis,* with stouter branchlets which turn brown the second season. The leaf bases are more swollen and the winter buds are not squarish in cross section; the scales are broader and thicker than in *T. canadensis.* The leaves are generally larger in all dimensions. The green margins below are much narrower than the stomate bands; they are equal or only slightly narrower in *T. canadensis.* The larger branches are not prostrate and rooting, but ascending. *T. hunnewelliana* differs also in being excurrent, unless propagated from lateral branchlets, and dioecious, with seed ripening irregularly and later.

The branchlets are more slender and less lustrous than those of *T. cuspidata,* and usually greenish the first winter. The winter bud scales are narrower than in *T. cuspidata,* and the ridge or keel less pronounced.

The leaves are proportionately narrower and thinner than those of *T. cuspidata* and less cuspid, almost acute. The undersides of the leaves have less yellowish color.

Plants of *T. hunnewelliana,* represented in the Secrest Arboretum by group 88 (A, C, E), were obtained from the Hilltop Nursery, Casstown, Ohio.

***Taxus hunnewelliana* 'Globosa'**

***Taxus hunnewelliana* 'Globosa'**

T. canadensis 'Globosa'; *T. media* 'Globosa'

These plants were received as "Taxus media globosa" from the Siebenthaler Co., Dayton, Ohio. They had been propagated as "cuttings from the one plant of unknown origin in our Nursery." The vegetative characteristics are more *T.* x *hunnewelliana* than *T.* x *media,* with considerable *T. canadensis* coloration. Probably no longer in the trade.

This cultivar is represented in the *Taxus* plantation by group 85 (B). Both sexes are recognized.

Taxus x *media* Rehder
Anglojap Yew

Rehder (31) proposed this name for the hybrids between *T. baccata* x *T. cuspidata,* recognizing that a wide variation of forms was possible ". . . between different varieties of the parent species which combine the characters of the parents in various degrees." For his type plant, he chose a plant described by Hatfield (19) as "English Yew at Wellesley." Rehder (31) took cognizance of the difficulty of identification in the statement, "As the two parent species cannot be separated by strong morphological characters, it is even more difficult to point out good characters to distinguish the hybrid; the differences become really apparent only by comparison with living plants of the two parent species."

Taxus media

Both sexes of this hybrid exist. The species is not now generally available in the trade. Plants in group 59 (A, C) in the Secrest Arboretum were obtained from the Perkins-DeWilde Nursery of Shiloh, N. J. Other *T. media* are located in group 91 (B, D).

***Taxus media* 'Amherst'**

This cultivar, of both sexes, was grown from seed of Hatfield origin at the Laddie Mitiska Nursery, Amherst, Ohio, and named after the city. The bright green foliage color holds well into winter. Leaves graduated, long at base to shorter at apex of twig, curved to show lighter undersides, of coarse *T.* x *media* type.

Twigs vigorous with some secondary branchlets the first year and many on later growth with shearing. A low-spreading shrub while young, becoming large, hemispherical with age, with most branches ascending. Has typical overall coarse appearance.

***Taxus media* 'Amherst'**

Plants of this cultivar, represented in the Secrest Arboretum by group 101 (A, E), were obtained from Laddie Mitiska Nursery.

***Taxus media* 'Andorra'**

T. cuspidata fastigiata Hort.; *T. cuspidata erecta* Hort.; *T. baccata erecta* Hort. not Loudon

This excellent female cultivar originated as a fastigiate sport in the center of a spreading "cuspidata type" plant in the Andorra Nurseries, Philadelphia, Pa., in 1916.

***Taxus media* 'Andorra'**

A conical or ovate shrub with a central leader and appressed fastigiate branches densely set with short branchlets.

Leaves mostly radial, glossy green with prominent midrib above, light olive green stomate bands below with narrow margins and midvein; mostly straight, about 2.5 cm. long, slightly tapered to an acute apex.

Seed crops heavy; aril subglobose, scarlet, 9 mm. broad by 8 mm. long, hardly exceeding the nutlet, opening elliptical to squarish, or circular with angular interior if exceeding the nutlet; nutlet brown, broad ovate, acutely 2-4 angled, 4-5 mm. broad by 6-7 mm. long, hilum ellipsoid to squarish, depressed angles with raised center.

Plants in group 16 (D) in the Secrest Arboretum were obtained from the Andorra Nurseries, Inc., Chestnut Hill, Philadelphia, Pa.

***Taxus media* 'Anthony Wayne'**

Taxus media 'Anthony Wayne'

The Hess Nurseries, Wayne, N. J., were granted Plant Patent No. 1617 for this strongly ascending vigorous cultivar as announced in American Nurseryman, 112:35, in 1960. Sold as a columnar plant, it becomes narrow vasiform if left unsheared, growing 9 feet tall by 6 feet wide in only 11 years. A female cultivar with moderate crops of seed. The plants in group 55 (A), obtained from Hess Nurseries, have an irregular "flame" shape.

***Taxus media* 'Berryhill'**

Taxus media 'Berryhill'

T. intermedia Berryhilli Hort.

This female cultivar was introduced to the trade by Frank Turner of Berryhill Nursery, Springfield, Ohio, before 1950. Its good winter hardiness, compact, dense, broad, low form has kept it in the trade. Growth is rapid enough to be profitable.

Leaves dark green, borne abundantly on compact twigs, falcate, those on short laterals much smaller in all dimensions than those on terminal twigs.

It was 6 feet high by 14 feet wide after 22 years. Specimens were only slightly damaged by the heavy snow of Dec. 1, 1974.

Plants of this cultivar, located in group 90 (A, E) at the Secrest Arboretum, were obtained from the Berryhill Nursery, Springfield, Ohio.

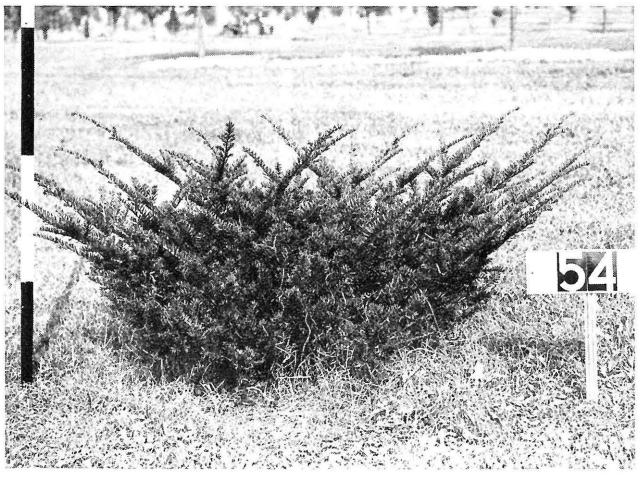
Taxus media 'Brevicata'

A mixed group of plants from Hatfield's original seedlings of *T. baccata* 'Fastigiata' x *T. cuspidata.*

***Taxus media* 'Brevicata'**

After Hatfield's death, his surplus stock was sold to Richard Wyman, Framingham Nurseries, Framingham, Mass., who marketed them. Later propagation from the seedling *T. media* hedge on the Hunnewell estate was also marketed as 'Brevicata'. The plants at Wooster were compact, broader than high, with short broad needles radiating from the twigs, much like those of *T. cuspidata* 'Densa' when young. Later, growth was rapid and plants became loose, irregular globes. Not often marketed today, the name 'brevicata' applied to the short, broad, leathery leaves.

Plants of this male cultivar, group 76 (C) in the Taxus plantation, were obtained from the Siebenthaler Co., Dayton, Ohio.



***Taxus media* 'Broad Beauty'**

***Taxus media* 'Broad Beauty'**

This low-growing, spreading cultivar was released by the Cole Nursery Co., Circleville, Ohio, but has now been withdrawn from the trade. The small male plants in group 54 (B, C, D, E) (photo) are only becoming established to start typical growth.

***Taxus media* 'Brownii'** Chadwick

T. cuspidata browni Kumlien; *T. browni* Hort.

This male cultivar was grown and named in honor of his friend, Robert Brown of Cottage Gardens, by T. D. Hatfield, head gardener on the Hunnewell estate, Wellesley, Mass., and not by the Cottage Gardens as reported by Kumlien.

The original plant is conical and excurrent, branching freely. Young plants are usually rather erect, even columnar as grown by some nurseries, becoming more spreading and broadly vasiform or globose with age. The growth is easily altered and controlled by shearing, which makes this cultivar a favorite subject for low hedges in formal plantings. Branches ascending at a 45° angle, or more erect with

***Taxus media* 'Brownii'**

decurved tips, twigs olive green, branching freely the second year.

Leaves rather short and narrow, close-set in a deep "V" exposing the olive green undersides, often with a reddish or brownish tinge in winter. The young tip color and fine texture of the twigs, with the prominent pollen cones in winter and early spring, make this cultivar easily recognized. One of the hardiest of the Yews.

This cultivar, represented in the Secrest Arboretum by groups 57 (B) (photo) and 94 (D), was obtained from C. E. Kern, Wyoming, Ohio.

***Taxus media* 'Brownhelm'**

Taxus media 'Brownhelm'

This cultivar was grown from seed of Hatfield origin, named and released by the Laddie Mitiska Nursery, Amherst, Ohio. A female cultivar of vigorous open growth with abundant secondary branchlets without shearing. With shearing, it forms a dense plant for early sale. Becomes open and large without shearing. The twigs have a tendency to twist, showing the underside of the leaves similar to *T. cuspidata* 'Thayerae'.

Plants of this cultivar, represented by group 103 (A, E) in the Secrest Arboretum, were obtained from the Laddie Mitiska Nursery, but production has been discontinued.

Taxus media 'Burr'

Taxus media 'Burr'

This cultivar of unknown origin was marketed by the C. R. Burr and Co., Inc., Manchester, Conn., who claim it is similar to 'Densiformis', but differs in being finer leaved and darker green, especially in winter. Its growth is even faster and more uniform. Plants of this cultivar are no longer offered by C. R. Burr & Co.

Plants of this male cultivar, located in group 28 (A, B, D, E) at the Secrest Arboretum, were obtained from the C. R. Burr and Co. Nursery.

Taxus media 'Chadwick'

Grown and introduced by Laddie Mitiska Nursery, Amherst, Ohio. Probably second generation from one of Hatfield's seedlings.

Low, horizontally branched, somewhat rounded. May get to 6 feet but slow. Stays lower in partial shade, with some upsweep to the branches. Leaves slightly bluish-green, falcate. Winter-hardy, but somewhat subject to late spring frosts. Said to be more difficult to transplant than some Taxus. Plants 20 years old 5 to 6 feet high, 24 to 25 feet across without shearing. One of the best of the low-spreading forms of Taxus. Easily restrained into a formal plant by a little pruning.

Taxus media 'Chadwick'

Plants of this female cultivar, located in group 102 (B, D) in the Taxus plantation, were obtained from the Laddie Mitiska Nursery.

Taxus media 'Coleana'

T. baccata erecta Hort. not Pilger; *T. erecta* Hort.; *T. cuspidata erecta* Chadwick

The Cole Nursery Co., Painesville, Ohio, discovered this female cultivar in a lot of imported cv. Hicksii Yew.

Taxus media 'Coleana'

This cultivar forms a broad, columnar shrub, nearly fastigiate at a young age. Twigs stouter than cv. Moon, but thinner than cv. Andorra and cv. Hicksii, with leaves more close-set and growth shorter than cv. Hicksii, which it resembles when small.

Leaves dark glossy green with prominent midrib above, gray green stomate bands, or yellow green in sun, with margins and midvein as in cv. Hicksii; rather plump and leathery, often exceeding 1 inch, broad at the base and tapering to a somewhat cuspid apex. Hardier and less winter leaf damage than cv. Hicksii.

Seed crops medium to heavy, late maturing, aril light red, oblate, 10 mm. broad by 7 mm. long, not equaling the seed, opening large, elliptical to circular, or adnate to nutlet and angular. Nutlet large, broad ellipsoid and blocky, 5 mm. broad by 7 mm. long, 2-4 angled but mostly 3-angled, brown with glaucous bloom.

Plants of this cultivar were obtained from the Cole Nursery Co., Painesville, Ohio, and are represented in the Secrest Arboretum by group 23 (A, C, E). To the authors' knowledge, this cultivar is no longer in the trade.

***Taxus media* 'Cole Type B'**

Taxus media 'Cole Type B'

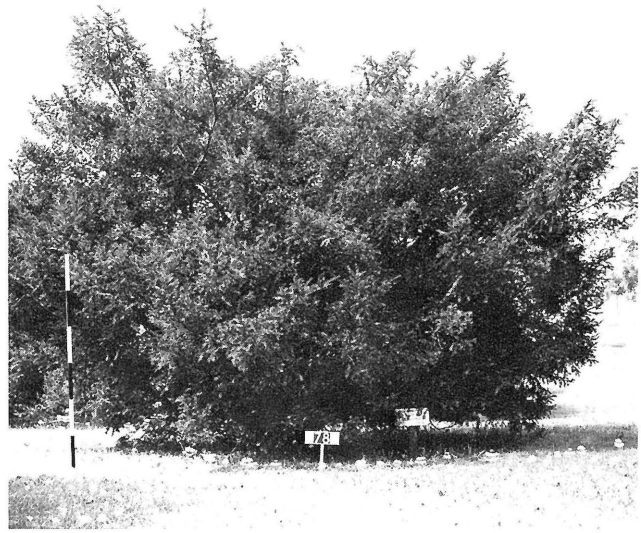
This cultivar was one of a series selected for observation by the Cole Nursery Co., Painesville, Ohio, but probably never marketed, although it has several good characteristics; *i.e.,* hardy, good habit of growth. A low-spreading plant of good density. Terminal twigs quite erect. Plants reached a height of 6 feet with 15 feet spread in 20 years.

Plants of this cultivar are located in group 53 (B) in the Secrest Arboretum.

Taxus media 'Compacta'

T. canadensis compacta Hort.

This female cultivar was received from the Siebenthaler Co., Dayton, Ohio, as *T. canadensis compacta.* It is reported to have been propagated from cuttings obtained from plants on a private estate near Dayton. Plants upright spreading in habit, forming a broad oval, attaining a size of 10 feet in height and a spread of 25-27 feet in 30 years. Foliage heavier and stiffer than that of *T. canadensis* or *T. hunnewelliana,* which it resembles. Branches stouter than those



***Taxus media* 'Compacta'**

***Taxus media* 'Costich'**

of *T. hunnewelliana.* Bark mottled brown and green on 2-year wood.

Plants of this cultivar are represented in the Secrest Arboretum by group 78 (A, C). This clone with an illegitimate name is not known to be in the trade.

***Taxus media* 'Costich'**

T. cuspidata hicksii No. 2 Hort.; *T. media hicksii No. 2* Hort.; *T. hicksii No. 2* Hort.

This male plant was selected from the same lot of seedlings as cv. Hicksii Yew by Professor C. S. Sargent, who considered it a superior hedge plant. Growth and appearance are much like that of cv. Hicksii. However, the cv. Costich Yew is more rapid growing and more narrow and erect if left unpruned. The original plant was adjacent to that of the cv. Hicksii, and the plants have often been mixed in the trade. The Costich cultivar is somewhat less damaged by winter burn than cv. Hicksii. Pollen cones are abundant, and conspicuous when shedding their pollen in March.

Plants of the Costich cultivar were obtained from the Princeton Nursery Co., Princeton, N. J., and are represented in the Secrest Arboretum by group 67 (D).

***Taxus media* 'Densiformis'**

This is one of the better, vigorous, dense *T. media* cultivars which branch freely without shearing. Usually sold as a low globe, but older plants have a broader spreading habit, nearly twice as broad as high. The color is bright green, but the apical leader and several strong secondary branchlets at the apex of the previous season's growth will hold the leaves in a narrow "V", exposing the lighter stomate bands. This cultivar is not always uniform in the trade. Some sources are more susceptible to winter and late freeze damage than others.

***Taxus media* 'Densiformis'**

***Taxus media* 'Donewell'**

Plants of this male cultivar were obtained from C. Hoogendoorn, Newport, R. I., and are represented in the Secrest Arboretum by group 97 (B, D, E).

***Taxus media* 'Donewell'**

T. media 'Kohankie' Hort.

This accession was found in the Donewell Nurseries, Painesville, Ohio, and was considered a superior type of an upright spreading yew. Growth is compact with flaring terminal branches. Foliage is glossy dark green; needles arranged in a single plane. In 17 years in the Taxus plantation, it has attained a height of approximately 7 feet with a 5-6 foot spread. This female cultivar was obtained from the Donewell Nursery, Painesville, Ohio, and is represented in the Taxus plantation by group 18 (D). Probably no longer in the trade.

***Taxus media* 'Drulia'**

This bright green female cultivar was introduced by the Drulia Nursery, Canfield, Ohio, but was not widely accepted in the trade. Growth is moderate, but well filled without shearing. Leaves dark green, pointing outward and upward from the twig. The seeds are scarce with the aril split into two, occasionally three, parts which are positioned as the next pair of scales on the cone. No longer in the trade, the plants in group 99 (D, E) were 8 feet high by 12-14 feet wide after 20 years.

Taxus media 'Drulia'

Taxus media 'Dutweilleri'

T. media dutweeleri Hort.; *T. media dutuilerdi* Chadwick

This cultivar was selected by Mr. Dutweiller, foreman at the Hicks Nurseries, Westbury, L. I.

This rather indistinct cultivar forms a dense vasiform or spreading shrub with ascending branches. Twigs yellow-green becoming olive green the second year or reddish where exposed to the sun. Terminal buds large.

Leaves thin, tapering, less than 1 inch long, nearly straight, bright glossy green above, olive green to orange below. Arranged pectinately, flat in one plane or in a broad "V" on ascending leaders.

Growth moderate, 6 to 12 inches per year, but branching freely without shearing to make dense, well-formed plants in a short time.

This cultivar may be either male or female, but male plants predominate. This cultivar was obtained from the Siebenthaler Co., Dayton, Ohio, and is represented in the Secrest Arboretum by group 75 (D).

Taxus media 'Dutweilleri'

Taxus media 'Emerald'

T. media 'Mitiska No. 6'; *T. media* 'Mitiska No. 33' Chad.; *T. media* 'Royal Emerald' Hort.

This dark green, female cultivar was introduced by the Laddie Mitiska Nursery, Amherst, Ohio. Vigorous ascending branches with secondary branchlets the first season. Winter-hardy but breaks dormancy early and may be damaged by late spring freezes. A dense root system competes well with other plants and facilitates balling from the field.

Plants measuring 3 feet in height with a spread of 4 feet in 1961 reached a height of 6-7 feet with a spread of 8-10 feet by 1973. These plants were not injured by the heavy snow of Dec. 1, 1974. Plants of this cultivar, located in groups 105 (A, B, E) (105 B in photo), 111 (A, B), and 112 (B), were obtained from the Laddie Mitiska Nursery.

This male cultivar was observed for many years before release in 1968 by the Cole Nursery Co., Circleville, Ohio, which has since discontinued evergreen production. This wide-spreading low plant of moderate vigor has only been observed since 1969, growing to 2-3 feet tall by 6 feet wide in 4 years. Leaves

***Taxus media* 'Everlow'**

short, bright, glossy green, arranged in a "V" pattern on spreading twigs. One of the best of the low-spreading Taxus.

It is available in the trade and is represented in the Secrest Arboretum by groups 115 (A), 116 (A, B), and 117 (A, B) (117 B in photo). This accession was obtained from the Cole Nursery Co.

***Taxus media* 'Fairview'**

T. media Hetz ALH Hort.

Accession received from the Fairview Evergreen Nursery, Fairview, Pa., in 1958 under the name of *Taxus media* Hetz ALH spreader.

Origin unknown. A broad, spreading cultivar of medium-rapid growth with medium-dark green foliage. In 1973, plants had reached a height of 6-7 feet with a spread of 10-12 feet. A male cultivar, it is located in group 20 (A).

***Taxus media* 'Fairview'**

***Taxus media* 'Flemer'**

Received from the F. & F. Nurseries, Springfield, N. J., as *Taxus cuspidata* "Compact Form". It is a *T. media* type and since there were several other selections received as 'Compacta', the name assigned is *Taxus media* 'Flemer'. Said to have been selected from seed obtained from T. D. Hatfield.

Plants are slow growing, quite rounded when young. Maintains a full center. Compact, it needs little or no pruning. Both male and female plants

***Taxus media* 'Flemer'** (female)

***Taxus media* 'Flemer'** (male)

were in the five plants received from the F. & F. Nurseries in 1942, but growth habit the same. In authors' opinion, this is one of the best selections in the entire planting.

Thirty-year plants in the Wooster collection are about 8 feet high with 20-22-foot spread with no pruning. Plants are represented by group 27; 27 (A, C) are female plants and 27 (E) is a male plant.

Taxus media 'Flushing'

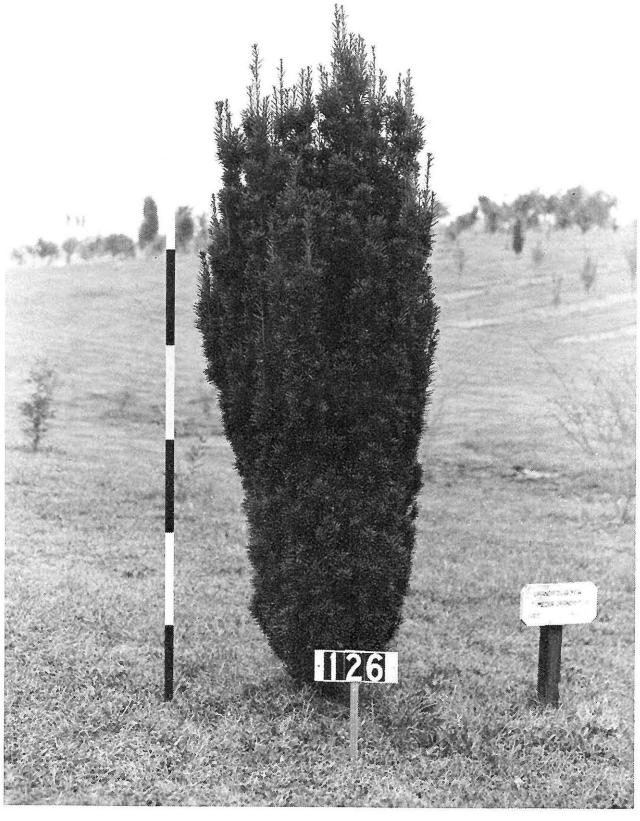
Taxus media 'Flushing'

Small plants received from John Vermeulen and Son, Inc., Neshanic Station, N. J., in 1956 and planted in the Taxus plantation in 1962. This cultivar is narrow columnar in growth habit, with compact, stout, erect branches. Foliage dark green; a female cultivar. In 10 years it attained a height of 9 feet with a spread of 2 to 2½ feet at the widest point. One of the best Vermeulen Upright selections. This cultivar is represented in the Secrest Arboretum by group 123 (A, C, D, E). It was injured only slightly by the heavy snow of Dec. 1, 1974.

This is one of several "Vermeulen Vertical Yews." In 1933 John Vermeulen selected 30 plants growing at Lake Grove, N. Y., which had a "tall slender look." These plants were obtained from Mr. Sexauer, a part-time nurseryman who had purchased seedlings from Hicks Nurseries, Westbury, L. I., which had been grown from seed picked at random.

Taxus media 'Grandifolia'

A John Vermeulen & Son, Inc., accession planted in 1962. A stoutly compact, branched, upright cultivar, widest at the top. Large, dark green foliage. In 10 years has attained a height of approximately 7 feet and 2 to 2½ feet wide at the top. A male type. One of the best of the Vermeulen se-



Taxus media 'Grandifolia'

Taxus media 'Green Candle'

lections. Injured only slightly by the heavy snow of Dec. 1, 1974. This cultivar is represented in the Secrest Arboretum by group 126 (A, B, C, D).

***Taxus media* 'Green Candle'**

T. media fastigiata Hort.

This cultivar was obtained from Laddie Mitiska Nursery, Amherst, Ohio, in 1951. It is a stiffly branched, narrow, columnar selection of compact, slow growth. In 23 years, plants have attained a height of 8 feet with a 3 to 4-foot spread. Foliage is dark green. It is a male cultivar and is represented in the Secrest Arboretum by group 100 (B, D). Plants of this cultivar have maintained an excellent columnar habit but were quite badly "pulled apart" by the heavy snow of Dec. 1, 1974.

***Taxus media* 'Green Mountain'**

This chartreuse green, patented, male cultivar, unique in the trade, was obtained from Bobbink Nurseries, Inc., East Rutherford, N. J. Vigorous, compact, branching freely with twisted branchlets which emphasize the yellowish undersides of the leaves. Usually marketed as a broad globe, the plants were 6 feet high by 18 feet wide after 17 years in group 81 (B, E).

***Taxus media* 'Green Mountain'**

***Taxus media* 'Halloriana'**

T. media Halloriana Pierson. Cat. 1934. ex Amer. Nurs. 93:1 (29), 1951; *T. media Halloriana* Den Ouden/Boom 1965; *T. media Halloran,* Wyman Garden Encyclopedia, 1971

Broad spreading, compact bush with flaring, erect branches. Rounded when young. Comparatively short, densely set, dark green, radially arranged leaves. Obtained in 1948, plants reached a height of 9-10 feet with a spread of 16-18 feet by fall of 1973. This female cultivar is in group 49 (A, D).

***Taxus media* 'Hatfieldii'** Rehder

T. Hatfieldii Hort.; *T. media hatfield No. 2* Hort.; *T. hatfield upright* Hort.

This male cultivar was named after T. D. Hatfield by Rehder (31). It was the best of the seedling "Irish Yews" produced at the Hunnewell estate. This cultivar is represented in the Secrest Arboretum by groups 48 (E) (photo), 54 (A) (photo), 63 (B), 64 (A), and 98 (A, C). Plant 54 (A) closely resembles the original description of the cv. Hatfield Yew.

Plants columnar or pyramidal while young, as grown by most nurseries, with appressed fastigiate branches. Left unpruned, the plants are more spreading and loose. Secondary branchlets appressed and abundant.

Leaves straight, mostly spirally radiating and close-set, especially on the secondary branchlets, dark

***Taxus media* 'Halloriana'**

***Taxus media* 'Hatfieldii'**

Taxus media 'Hatfieldii'

waxy green above with prominent midrib. Rather broad and leathery with slight taper and cuspid apex. Stomate bands below are very broad, bright gray-green, with very narrow margins and midrib below. Plant 54 (A) was obtained from C. R. Runyan, Spring Grove Cemetery, Cincinnati, Ohio.

Taxus media 'Hatfield No. 2'

The identity of the cultivar "Hatfieldii" has long been a moot question in the nursery trade because propagation material from Hatfield's trial block was not always left labeled. His "Second Irish" description on the first few numbers indicated the uniformity of these seedlings. No. 2 is not sufficiently different, nor superior when sheared as small salable plants, to give it a separate name. Those who wish to propagate the true plant should obtain propagation material from the type plant at Arnold Arboretum. No. 2 is not like *T. baccata* 'Fastigiata' at maturity, but practically identical to 'Hatfieldii'. This male cultivar was obtained from C. R. Runyan, Cincinnati, Ohio, and is represented by group 95 (C). Not in the trade or mixed with 'Hatfieldii'.

Taxus media 'Hatfield No. 2'

Taxus media 'Hatfield No. 6'

Much less fastigiate than cv. Hatfieldii, this Hatfield number has disappeared from the trade. As an old, globose plant it is superior to many of the fast-growing, quickly marketable cultivars currently being sold as globes and spreaders. It is represented by group 80 (A). Current dimensions are 12 feet high by 15 feet spread. This female cultivar was obtained from the Tingle Nursery Co., Pittsville, Md. Not in the trade or mixed with *T. m. 'Hatfieldii'*.

Taxus media 'Hatfield No. 6'

Taxus media 'Hatfield No. 18'

This excurrent tree in the Hatfield trial block has never been generally offered in the trade. This male *T. media* cultivar is darker blue-green than *T. m.* 'Brownii', but the same ascending habit when small. The plants in group 69 (C) were propagated from lateral twigs and so lack the excurrent leader. Not in the trade or mixed with *T. m. 'Hatfieldii'*.

Taxus media 'Hatfield No. 18'

Taxus media 'Hatfield No. 19'

This male cultivar was never in the trade, a surprise considering that the seed parent was a sheared crucifix of *T. baccata* 'Fastigiata'. It has ascending branches with weeping twigs and branchlets similar to *T. baccata* 'Dovastoniana' or an old Norway spruce. The color is not as dark as cv. Dovastoniana; otherwise the *T. media* characteristics prevail. The parent tree is a large excurrent tree at the corner of the Hatfield trial block. The large plant in group 95 (A) lacks a central leader. Plants were obtained from the Leonard Nursery, Piqua, Ohio. Not in the trade.

Taxus media 'Hatfield No. 19'

Taxus media 'Hatfield No. 23'

Taxus media 'Hatfield No. 23'

This cultivar is another of the group of the Hatfield trial block briefly sold by Richard Wyman. It is hardy, spreading to ascending, but never fastigiate. Early growth is probably too slow to compete with *T. m.* 'Densiformis' and similar *T. media* cultivars currently in the trade. In 30 years, plants have reached a height of 9-10 feet with a spread of 15-17 feet. From the customers' standpoint, the dense form without shearing, as exhibited in group 46 (C), may be an advantage worth buying. Plants of this male cultivar were obtained from Tingle Nursery Co., Pittsville, Md. Not in the trade.

Taxus media 'Henryi'

This male cultivar was selected and introduced by Henry Verkade of the Henry Verkade Nursery, New London, Conn.

Taxus media 'Henryi'

A wide-spreading shrub of rapid growth, branching freely in a second flush of growth on current season's twigs without being sheared, especially on vigorous plants in the field. Twigs slender, slightly ascending and arching, or with decurved apex if strongly ascending.

Leaves bright green, slender, tapering and quite long, to 1½ inches, with prominent midrib above and distinct slender petiole. Arranged in broad "V" on upper side of twig or pseudo 2-ranked but irregularly falcate and twisted to produce a "curly" effect.

Plants of this cultivar are located in group 107 (A, C, E).

***Taxus media* 'Hicksii'** Rehder

T. cuspidata hicksii Hort.; *T. hicksii* Hort.

This female cultivar was selected by C. S. Sargent from some 50 upright seedlings chosen from the seed block by Mr. Dutweiller, foreman at the Hicks Nursery, Westbury, L. I.

It is an erect growing, fastigiate plant with ascending branches. Young plants narrow columnar, becoming broader with age and additional leaders. Old plants ovate or globose, and susceptible to snow and ice damage.

Leaves long, more than 1 inch, radial spreading and tapering on vertical twigs; scattered on upper side of horizontal twigs or pectinate, with cuspid apex. Dark glossy green with prominent midrib above, gray green or slightly glaucous below.

Seed often abundant, aril large, 9 mm. in diameter, scarlet with white bloom, globular, exceeding the nutlet by one-fourth, opening large as seed, interior squarish. Nutlet large, dark brown, 5 mm. broad by 7 mm. long, broad ovate, plump, obtusely 2 to 4-angled.

According to Rehder (31), this hybrid cultivar ". . . was raised by Henry Hicks from seed of *T. cuspidata* f. *nana* Rehd. collected in C. A. Dana's garden at Dosoris, Long Island, . . ." Henry Hicks pointed out the seed parent of this plant and thought that the pollen parent might have been the adjacent "Blue John Yew" (*T. baccata* 'Glauca') which was planted near the seed parent.

Since the seed parent is known, and the cv. Hicksii is a media or hybrid type, it seems obvious to the authors that the pollen parent must be the "Blue John Yew".

This cultivar is represented in the Secrest Arboretum by groups 37 (A, D) (37 D in photo) and 50 (B). Plants were obtained from several sources.

***Taxus media* 'Hill'**

T. cuspidata columnaris (Hill) Hort.; *T. cuspidata pyramidalis* (hilli) Hort.; *T. nana pyramidalis hilli* Hort.; *"Hill Pyramidal Yew"* Kumlien.

This cultivar was selected for superior hardiness and introduced by the D. Hill Nursery Co., Dundee, Ill., from material imported as "Taxus Hybrids" from Koster and Co., Boskoop, Holland, prior to 1917. This is probably of American origin, since most of the

***Taxus media* 'Hicksii'**

***Taxus media* 'Hill'**

hybrids in Holland were sent there by Dutch-American nurserymen for propagation.

A dense columnar or pyramidal shrub of slow growth while small. Twigs dark olive green, main leaders medium stout with rather thick leathery bark.

Leaves mostly radial, very dark glossy green above, dull olive green below; slightly tapered, with a cuspid apex on dense, close-set leaves of lateral branchlets; on main shoots tapered with acute apex, and more scattered. A male cultivar with light scattered crops of pollen cones.

Plants were obtained from the D. Hill Nursery Co., Dundee, Ill., and are represented in the Secrest Arboretum by group 45 (B, D).

Taxus media 'Hoogendoorn'

An accession received from the Hoogendoorn Nurseries, Inc., Newport, R. I., in 1958. Background history not known.

An upright spreading cultivar of medium to rapid growth rate. Foliage dark green. In the fall of 1973, plants measured 5-6 feet in height and 5-6 feet in width. Could be trained into a uniform hedge with little pruning. A male cultivar located in group 21 (A) in the Taxus plantation. This cultivar was never offered in the trade according to Case Hoogendoorn of the Hoogendoorn Nurseries.

Taxus media 'Kelseyi'

T. media "vase shape" Hort.; *T. media jeffreyi pyramidalis* Hort.

This cultivar was propagated from plants on a small estate in Locust Valley, L. I., by John Vermeulen. The plants may have come from Hatfield by way of Havemeyer's Cedar Hill estate or from the Hicks Nursery. Its good winter hardiness favors the latter source. Vermeulen's Nursery introduced the cultivar in 1928 under the name "Vase Shape", later changing it to *T. media* 'Kelseyi' in honor of F. W. Kelsey of New York City.

An erect or strongly ascending to fastigiate vasiform shrub, of medium growth rate. Twigs and buds as in *T. media.* Leaves very dark glossy green, tapered, acute, straight, about 1 inch long, close set in a deep "V" or scattered on upper side of twigs, exposing the abundant crop of late maturing seed for which this cultivar is noted. The seed may persist all winter. Little if any winter damage at Wooster, Ohio.

Aril scarlet with whitish bloom, subglobose, 9 mm. broad by 7 mm. long, scarcely equaling the nutlet, opening circular with squarish or angular interior. Nutlet broad ovate to blocky, 4 mm. broad by 6 mm. long, mostly 3-4 angled, obtuse.

Plants of this female cultivar were obtained from several sources. It is represented in the Secrest Arboretum by groups 5 (B) (photo), 65 (D), and 68 (B). Plants in group 5 were obtained from the Siebenthaler Co., Dayton, Ohio.

Taxus media 'Kobel'

The 'Kobel' Yew, added to the collection in 1962, was donated by Kobel's Nursery, West Lafayette, Ohio. No background information on its origin is available.

Taxus media 'Hoogendorn'

Taxus media 'Kelseyi'

Taxus media 'Kobel'

A broad-spreading, rather loosely branched plant of rapid growth. In 1973 plants had attained a height of 5 to 6 feet with a spread of about 12 feet.

Foliage medium green, short, especially on the lateral twigs. Falcate and closely arranged, giving a "bunchy" appearance on terminal twigs.

A male cultivar located in groups 109 (A) (photo) and 110 (B).

***Taxus media* 'L. C. Bobbink'**

An accession from the Bobbink Nurseries, Inc., Freehold, N. J., obtained in 1968. No background information is available on this selection.

Taxus media 'L. C. Bobbink'

Plants are upright spreading in growth habit, with nearly erect branches forming a rather loose top when not sheared. Foliage a bright glossy green. In 6 years plants developed from 15 to 18-inch specimens to 4 to 5 feet in height with a spread of 3 to 4 feet.

This male cultivar is located in groups 38 (B, C, D, E) (38 E in photo) and 47 (B).

***Taxus media* 'Lodi'**

An accession obtained from the Anderson Nursery, Lodi, Ohio, in 1958. No background information is available.

A compact, bushy plant of rounded growth habit. Leaves medium green. Narrow and loosely arranged on terminal twigs. In 16 years plants have attained a height of 8 to 9 feet with a spread of approximately 8 feet.

A male cultivar, it is located in group 62 (A, C) in the Taxus plantation.

Taxus media 'Lodi'

***Taxus media* 'Mitiska Upright'**

T. media Mitiska No. 7 Hort.

This accession was obtained from the Laddie Mitiska Nursery, Amherst, Ohio, in 1951. It has an interesting habit of growth, being compact, upright rectangular in shape with short, light to medium green foliage. As a hedge plant it would require very little pruning. In 23 years it has attained a height of 6 feet with a spread of 3 to 4 feet.

This male cultivar is in group 106 (A, B, C, D). Plants of this cultivar showed very little injury from the heavy snow of Dec. 1, 1974.

Taxus media 'Mitiska Upright'

Taxus media 'Moon'

The origin of this female cultivar is unknown, but the William H. Moon Nursery, Yardley, Pa., introduced it to the trade before 1925.

This old cultivar is a dark green, columnar, fastigiate shrub. The twigs are erect, appressed, and quite slender, often with considerable secondary growth the first season on vigorous leaders.

Leaves very dark green with prominent midrib on basal half above, light green with midrib and margin mere lines below; usually less than 1 inch long, slender tapering and acute, arranged radially, rather close set and dense.

Taxus media 'Moon'

Seed matures late, aril crimson with white bloom, subglobose, 9 mm. broad and 8 mm. long, slightly exceeding the nutlet; opening as large as nutlet, elliptical or angular. Nutlet dull chestnut brown, broad ovate with obtuse or 'mucronate' apex, compressed and 2-angled.

Plants of this cultivar were obtained from the Moon Nursery and are located in group 89 (B) in the Secrest Arboretum.

Taxus media 'Natorp'

Taxus media 'Natorp'

T. media 'Natorpiana' Hort.

This female cultivar was propagated for years from an old plant near the office at the W. A. Natorp Co., Cincinnati, Ohio.

It is a dense, compact, hardy plant, branching freely. It is marketed as a low globe and becomes a low spreader similar to cv. Berryhill.

In 16 years the plants in group 30 (B, D) reached 6 to 7 feet high by 15 to 17 feet spread. Plants were obtained from the W. A. Natorp Co.

Taxus media 'Newport'

Taxus media 'Dwarf' Chad.

This accession was obtained in 1954. No background information on this selection has been received.

Of very slow growth, attaining a height and spread of only 3 to 3½ feet in 20 years. Branches form irregular mounds, densely covered with short, dark green leaves. Growth may be so dense as to "shade out" the inner foliage. Plants 1½ feet high in 1954 are now 3 to 4 feet in height and spread.

A female cultivar located in groups 32 (B), 41 (C), and 108 (B, C, E) (108 E in photo).

Taxus media 'Newport'

Taxus media 'Ohio Globe'

T. media Mitiska No. 5 Hort.

Grown from seed of Hatfield source by Laddie Mitiska Nursery, Amherst, Ohio. Usually sheared to globe shape which is more easily maintained than sheared *T. m.* 'Brownii'. The shape is not lost with age, even when unsheared.

Leaves have a bluish-green color cast.

Plants were only slightly damaged by the heavy snow of Dec. 1, 1974. Plants in group 104 (B, D) were obtained from the Laddie Mitiska Nursery in 1951. It is a male cultivar.

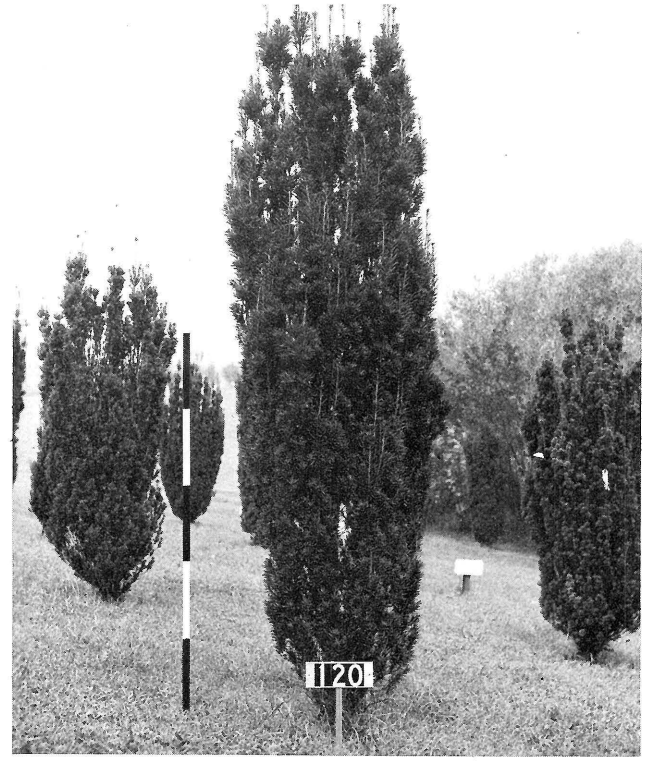
Taxus media 'Ohio Globe'

Taxus media 'Peterson'

Taxus media 'Peterson'

An accession obtained from Charles J. Peterson of Xenia, Ohio, in 1962. Described as a superior form of *Taxus media* 'Runyan' of exceptional winter hardiness. Wide-spreading growth habit similar to *Taxus media* 'Runyan' of young age. Leaves dark green, short, closely arranged on the branches, abruptly acute, curved.

In 10 years, plants of cv. Peterson have obtained a height of 5 feet with a spread of 9 to 10 feet. A female cultivar, located in groups 113 (B) (photo) and 114 (A) in the Taxus plantation.



Taxus media 'Pilaris'

Taxus media 'Pilaris'

A John Vermeulen & Son, Inc., accession planted in 1962. A narrow, nearly columnar, upright cultivar with sturdy erect branches and medium to dark green needles. Less compact than cv. Flushing, cv. Grandifolia, and cv. Sentinalis. Slightly widest above the middle.

In 10 years plants are approximately 9 feet high and 2½ to 3 feet wide. A male cultivar. Plants are located in group 120 (B, C, D, E).

Taxus media 'Pyramidalis'

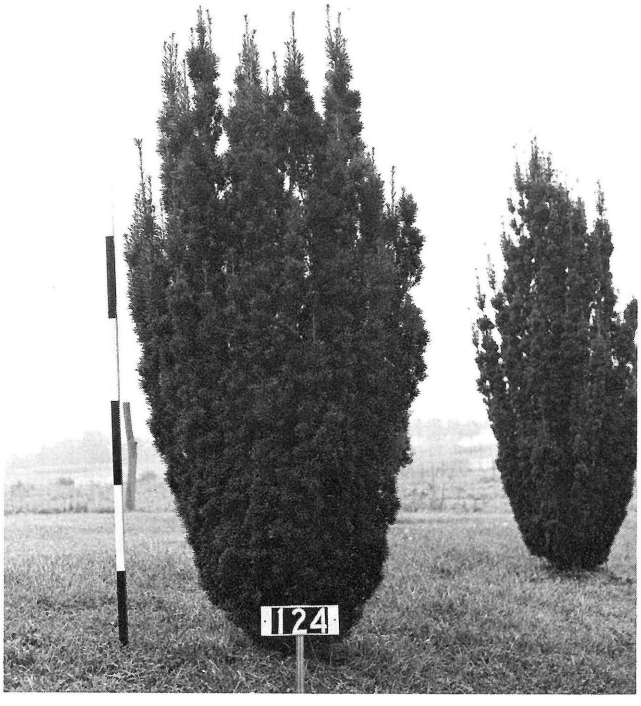
Another John Vermeulen & Son, Inc., accession introduced under an illegitimate name. Sturdy, upright habit of growth resembling *T. media* 'Hicksii' when young; widest above the middle. Foliage medium to dark green.

In 10 years plants have attained a height of 7 to 8 feet with a spread at the widest point of 3 to 4 feet. A female cultivar located in group 124 (A, B, C, D, E) in the Secrest Arboretum.

Taxus media 'Robusta'

A John Vermeulen accession planted in 1962. It carries an illegitimate name. Narrow, columnar habit of growth, with stiff, erect, compact branches. Slightly broader above the middle. Foliage large, dark green.

In 10 years plants have attained a height of approximately 8 feet and are 2 to 3 feet wide. A male cultivar located in group 125 (A, B, C, D, E).



Taxus media 'Pyramidalis'

Taxus media 'Robusta'

Taxus media 'Roseco'

An accession received from the Westbury Rose Co., Westbury, L. I., in 1962. This cultivar grows vigorously and in 10 years has attained a height of 6 to 7 feet with a spread of 15 to 17 feet, with wide-spreading, lateral branches.

Foliage is dark green, borne abundantly on short laterals.

It is a male cultivar. No information is available on the actual origin of this type. It is located in group 118 (A, C, E) in the Secrest Arboretum.

Taxus media 'Roseco'

Taxus media 'Runyan'

Taxus media 'Runyan'

T. media No. 8 Hort.

This "Hatfield No. 8" cultivar was a favorite with the late C. R. Runyan, superintendent of the Spring Grove Cemetery, Cincinnati, Ohio. It continues as one of the favorite yews in Ohio nurseries and is named in his honor. Plants are compact, well filled, and more rapidly growing than *T. cuspidata* 'Nana' which it superficially resembles. The early low globes in group 83 (D) have reached 11 feet high by 18 feet spread in 30 years. Crowding may have modified to some extent the wide hemisphere shape expected.

Plants of this cultivar are very winter-hardy and were only slightly injured by the heavy snow of Dec. 1, 1974. This male cultivar was obtained from C. R. Runyan in 1942.

Taxus media 'Sebian'

T. cuspidata intermedia Hort.; *T. cuspidata intermedia Sebians* Hort.

This male cultivar originated in the nursery of Mike Sebian, Painesville, Ohio, as a seedling of *T. cuspidata* 'Intermedia'. Small plants resemble the parent cultivar from Cottage Gardens Nursery or *T. cuspidata* 'Nana', except that the needles are lighter green and more narrow than the latter. Growth begins early in the spring and may be damaged by late frost. It makes up a salable plant quickly. Older plants lose some of the low, compact resemblance to *T. cuspidata* 'Nana' and become more informal and wide spreading with age. Secondary branching occurs abundantly, without shearing, keeping plants well filled and dense.

Leaves mostly straight, only slightly falcate, slightly tapered and acute or acuminate, not cuspidate, bright green with a tinge of red in newly opened buds. Mostly radial on secondary branchlets and on young plants. On older plants the leaves are on the upper side of the twig or in a broad pectinate "V" on arching branches.

Plants of this cultivar were obtained from Mike Sebian and are in group 43 (A, E).

Taxus media 'Sebian'

Taxus media 'Sentinalis'

A John Vermeulen & Son, Inc., accession planted in 1962. A stiffly branched, narrow, upright cultivar with dark green, curled foliage. Broadest above the middle.

In 10 years in the plantation, plants have attained a height of 8 to 9 feet and a width of 2 to 2½ feet. A female cultivar located in group 122 (A, B, C, D, E) in the Secrest Arboretum. Plants were somewhat pulled apart by the heavy snow of Dec. 1, 1974.

Taxus media 'Sentinalis'

***Taxus media* 'Stovekenii'**

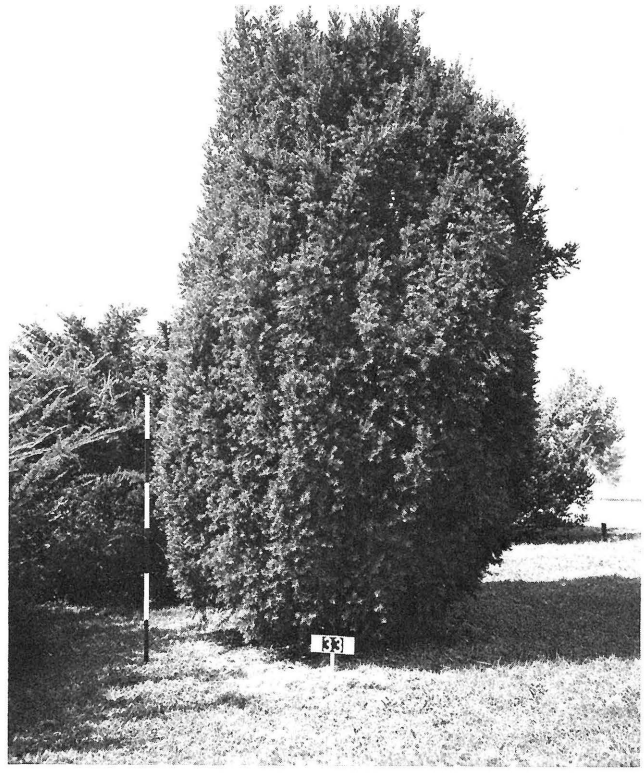
T. stovekeni Hort.; *T. cuspidata stovekeni* Hort.

The original plant was selected about 1932 from a block of seedling *T. cuspidata* by Mr. Stoveken, foreman of the A. N. Pierson Nursery, Cromwell, Conn. All vegetative characteristics indicate it is a *T. media* type and not a cultivar of *T. cuspidata.*

This fastigiate cultivar is vigorous, growing 12 to 18 inches annually. The habit is broad columnar. The branches are erect, fastigiate, and appressed, with some secondary twigs or branchlets growing on the current season's growth of vigorous leaders. Bark of leaders is thick and leathery, green becoming bright red-orange where exposed to winter sun and red-brown the second summer, except for the adnate leaf bases which are green.

Leaves are dark green, glossy, mostly radially spreading, about 1 inch long, slightly tapered with acute apex. No winter damage has been observed on the leaves of this cultivar at Wooster. The pollen cones are large and showy in late winter and spring.

A male cultivar located in group 33 (A, C). Plants of this accession were obtained from the A. N. Pierson Nursery. It has been considered one of the hardiest and very best narrow columnar yews, superior in many aspects to cv. Hicksii and cv. Costich. It was badly pulled apart by the heavy snow of Dec. 1, 1974, as were the other cultivars mentioned here.



***Taxus media* 'Stovekenii'**

***Taxus media* 'Stricta'**

An accession from John Vermeulen & Son, Inc., Neshanic Station, N. J. Another Vermeulen upright type, but looser at the top than 'Flushing', 'Robusta', or 'Viridis'. Needles medium to dark green, large.

In 10 years plants have attained a height of 7 to 8 feet with a width of about 3 feet near the top. A male cultivar, plants are located in group 121 (B, C, D, E). This illegitimately named cultivar is no longer being grown by John Vermeulen & Son, Inc.

***Taxus media* 'Stricta'**

***Taxus media* 'Totem'**

T. media pyramidalis Hort.

This cultivar, represented by group 70 (B) in the Secrest Arboretum, is not currently available in the trade. It was distributed by the Wilton Nurseries, Wilton, Conn., which no longer exist.

An extremely narrow, columnar shrub while young, with appressed short branchlets and a single leader. Becomes broader with age. Leaders stout, olive green, turning orange to brown in the sun, with numerous short branchlets the same season. Secondary branchlets short, slender, olive green, densely scattered and appressed.

Leaves dark glossy green with prominent midrib above, light gray-green stomate bands about twice as wide as margins or midrib beneath; long tapering, to

1¼ inches with acute apex, close set and densely radiating on branchlets.

Plants of this female cultivar were obtained from the Siebenthaler Co., Dayton, Ohio. They were badly damaged by the heavy snow of Dec. 1, 1974.

***Taxus media* 'Vermeulen'**

T. cuspidata 'Upright brevifolia' Hort.; *T. cuspidata vermeuleni* Hort.; *T. media hicksi,* improved Hort.

This female cultivar, like *T. media* 'Kelseyi', was propagated from a plant on a Locust Valley, L. I., estate by John Vermeulen, who introduced it into the trade in the late 1920's as *T. cuspidata* "upright brevifolia". Whether the original plant was planted by the Hicks Nursery, which had several "upright brevifolias", or was from one of Hatfield's "upright brevifolias" by way of Havemeyer or Cottage Gardens is a moot question. The name *"Vermeuleni"* was applied by retail customers of the Vermeulen Nursery, according to John Vermeulen.

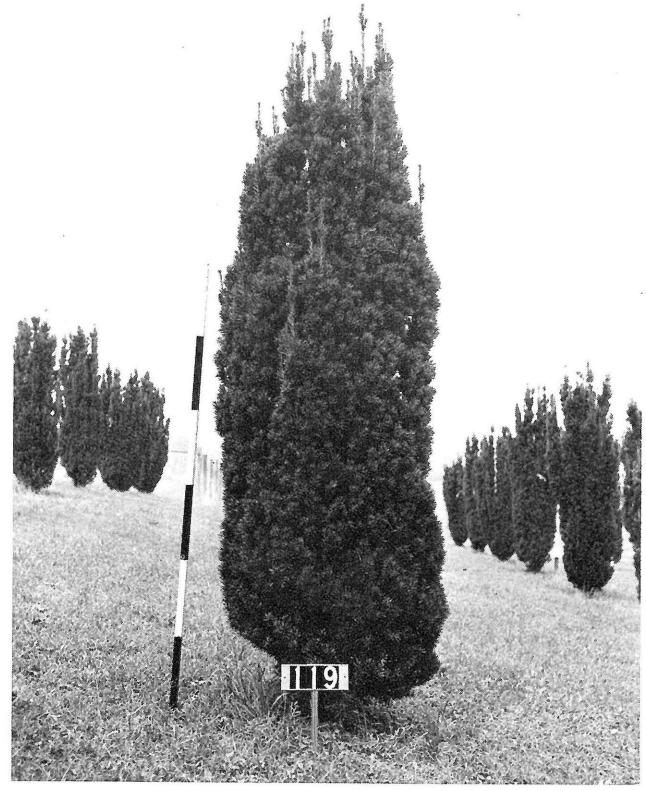
This cultivar makes a dense, columnar, vasiform or globose shrub with vertical fastigiate branches. Leaves mostly radial, close set, deep glossy green above, light gray to yellowish green below, mostly straight, slightly tapered with acute apex, rather wide.

Seed crops often heavy and late to mature. Aril crimson with whitish bloom, subglobose, 10 mm. broad by 9 mm. long, exceeding the nutlet by one-third; opening large, elliptical to squarish or round with angular interior. Nutlet very broad ovoid, obtusely 2-4 angled, mostly 3-angled, 5 mm. broad by 6 mm. long, brown, with glaucous apex, smooth and plump.

In the Secrest Arboretum this cultivar is represented by groups 64 (C) and 80 (D) (photo). At Wooster it can be recognized in late winter by the

***Taxus media* 'Vermeulen'**

***Taxus media* 'Totem'**



***Taxus media* 'Viridis'**

white, sun-scalded needles on the lower part of the southwest side of the plants.

***Taxus media* 'Viridis'**

Another of the Upright Yew accessions from John Vermeulen & Son, Inc., planted in 1962.

Dense and compact with stout erect branches. Plant broadest at the base. Leaves fresh, green, and somewhat twisted. In 10 years plants have attained a height of 8 to 9 feet with a spread at the base of 3 to 3½ feet. A male cultivar. It is located in group 119 (B, C, D, E) in the Secrest Arboretum.

***Taxus media* 'Wardii'** Chadwick

T. cuspidata cliftoni Hort.; *T. cuspidata wardi* Hort.

This cultivar was selected and named by R. T. Brown of Cottage Gardens, Queens, L. I., after one of his employers. It originated from one of T. D. Hatfield's seedling "upright brevifolias". Identical material was included with some *T. media* plants he sent to Harry Deverman of Clifton, N. J., who recognized the merits of this plant and named it "Cliftoni".

This wide, irregular, spreading shrub is of moderately rapid growth, the branches ascending with decurved or nodding tips. Considerable branchlet development occurs on strong, current season's growth. The twigs are rather stout with thick, soft, leathery bark, olive green or turning reddish where exposed to the sun, especially in winter. Growth starts early.

Leaves dark lustrous green with prominent midrib above, quite broad and leathery, bluntly cuspid, mostly less than 1 inch long, shorter at the beginning and end of each season's growth on lateral twigs, giving a distinct oval segmented appearance to older twigs. Stomate bands light green to olive green, very broad, the leaf margins and midrib a mere line below.

A female cultivar with heavy crops of late maturing seed and many twin flowers and seeds. Aril bright red with whitish bloom, a broad, oblate, fleshy cup 11 mm. wide by 7 mm. long, scarcely equaling the nutlet. Opening large, circular, with squarish or angled interior. Nutlet globose, dark glossy brown with dull bloom, 4 mm. broad by 5 mm. long, obtusely 2-4 angled.

This cultivar includes groups 41 (A) (photo), 46 (A), and 72 (B, D). Plants in group 41 were obtained from Harry Deverman.

***Taxus media* 'Wellesleyana'**

This male cultivar is one of the hardy seedlings of the *T. baccata* 'Fastigiata' produced by T. D. Hatfield. It is a columnar to vasiform shrub with vertical fastigiate branches.

Twigs coarser than *T. media* 'Hatfieldii', which it greatly resembles, as is the entire plant. Leaves

***Taxus media* 'Wardii'**

***Taxus media* 'Wellesleyana'**

***Taxus media* 'Wilsonii'**

bright green, spirally radiating or scattered on upper side of branchlets.

Growth is more rapid and loose than cv. Hatfieldii and more liable to damage from snow and ice in winter.

Plants of this cultivar were obtained from C. R. Runyan, Spring Grove Cemetery, Cincinnati, Ohio, and are located in group 82 (A, C).

Taxus media 'Wilsonii'

Plants of this cultivar were obtained from the Cole Nursery Co., Painesville, Ohio, in 1953. Early records of the selection were lost, but Barrett Cole was of the opinion that the original plants were obtained from C. E. Wilson Nursery Co.,, Manchester, Conn.

Plants of this selection form a compact, rounded bush, somewhat broader than high (9 to 10 feet by 15 feet).

Leaves medium texture of medium to dark green, curving upward and outward, exposing the lighter green underside. A male cultivar located in group 71 (A, C).

THE BEST OF THE TAXUS

During the years the project has been in progress, the senior author has prepared lists of Taxus entitled The Best of the Taxus and Some Recommended Taxus for publication (9) and for discussion at several nurserymen's association meetings. Such lists have been dated 1950, 1959, 1960, 1962, 1965, and 1974. Changes have been constantly made in these lists as additional data were accumulated and observations were made. Any list of this nature must be flexible. New cultivars, some superior to existing types, will continue to be introduced.

The earlier lists were compiled on the basis of limited observations and on catalog or other descriptions. With age, growth habits of several cultivars have markedly changed, and as they matured they varied greatly from early catalog descriptions. As an example, *Taxus cuspidata* 'Adams' was described and introduced as a narrow, upright cultivar. When not restricted by constant pruning, specimens planted in 1942 in the Taxus plantation now measure 13 to 14 feet in height with a spread of 25 to 27 feet.

The following list of recommended cultivars is based on the authors' observations. Such factors as size, growth habit, hardiness, foliage, and fruiting characteristics were considered. Compiling the list on the basis of size and growth habit denotes types which can be used to satisfy the requirements of various landscape designs. Selections are not based on ease of propagation or rapidity of production, but rather on hardiness, adaptability, and possession of superior growth habits and foliage. As new and superior cultivars are introduced, substitution for existing inferior types should be practiced. There is no basis for growing an exceedingly long list of cultivars. Select the best. Selections from the recommended list can be made based on regional climatic conditions and landscape demand. Although the recommended forms are based on size and general habit of growth, these factors cannot be exact. Dimensions may be exceeded and growth habits may be variable from those specified.

SOME RECOMMENDED TAXUS

Small Types, 1-5 Feet

Low, Spreading Types

Taxus baccata 'Repandens'
Taxus media 'Chadwick'
Taxus media 'Everlow'

Slow Growing, Compact, Rounded Types

Taxus cuspidata 'Densa'
Taxus media 'Newport'

Slow Growing, Horizontal Spreading Types

Taxus cuspidata 'Nana'

Medium Types, 6-10 Feet

Slow Growing, Compact or Rounded Types

Taxus baccata 'Adpressa'
Taxus media 'Emerald'

Compact, Broadly Rounded Types, Broader Than High

Taxus media 'Amherst'
Taxus media 'Brownii'
Taxus media 'Densiformis'
Taxus media 'Moon'

Compact, Spreading Types

Taxus media 'Berryhill'
Taxus media 'Flemer'
Taxus media 'Natorp'
Taxus media 'Sebian'
Taxus media 'Wardii'

Narrow, Upright Types

Taxus media 'Flushing'
Taxus media 'Grandifolia'
Taxus media 'Sentinalis'

Large Types, 10 Feet or More

Compact, Rounded Types, Broad as High

Taxus media 'Lodi'
Taxus media 'Ohio Globe'

Compact, Broadly Rounded Types, Twice as Broad as High

Taxus media 'Dutweilleri'
Taxus media 'Halloriana'
Taxus media 'Henryi'
Taxus media 'Runyan'
Taxus media 'Vermeulen'

Broad, Upright, Spreading Types

Taxus cuspidata 'Adams'
Taxus cuspidata 'Thayerae'
Taxus media 'Wellesleyana'

Broad, Columnar Types

Taxus media 'Costich'
Taxus media 'Hicksii'
Taxus media 'Stovekenii'

Broad, Pyramidal Types

Taxus baccata 'Dovastoniana'
Taxus cuspidata 'Capitata'
Taxus media 'Hatfieldii'
Taxus media 'Hill'
Taxus media 'Kelseyi'

CONCLUSIONS

The taxonomy of the genus *Taxus* is controversial. The recognized species are more geographic than morphologic and many of the cultivars and clones in America have not been described or named by horticulturists in accord with the International Code of Nomenclature of Cultivated Plants (2). The confusion of names at the species and cultivar levels is a distinct handicap to the nursery and landscape trade.

It is the hope of the authors that this publication may aid in furnishing descriptive information of many of the cultivars now in the trade. There is still much work to be done on establishing the correct nomenclature of several cultivars now in commerce, and others which no doubt will be introduced. Every effort should be made to follow the rules of the International Code in naming new cultivars and to clear the proposed cultivar name with the Registration Authority for Dwarf and Other Garden Conifers, the Royal Horticultural Society.

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GLOSSARY

Aril—An appendage growing out from the hilum and covering the seed partly or wholly.

Bisexual—Having both stamens and pistils.

Cultivar—A cultivated variety. A named group of cultivated plants which are distinguished from other members of the same species or interspecific hybrid by any combination of genetic traits which may be significant in relation to the purposes from which the plants are cultivated.

Cuspidate—Sharp-pointed.

Decurrent—(Leaf) Extending down the stem below the insertion.

Dioecious—Male and female flowers on different plants.

Emarginate—With a shallow notch at the apex.

Excurrent—With a projecting tip. (Stem) Upright.

Falcate—Sickle-shaped.

Fastigiate—With stems or branches erect and close together.

Hilum—The scar or point of attachment of the seed.

Keel—A central ridge.

Micropyle—The orifice of the ovule.

Monoecious—With unisexual flowers of both sexes on the same plant.

Mucronate—Tipped with a short abrupt point.

Orthotropic—(Stems or branches) Upright.

Ovule—The body which after fertilization becomes the seed.

Plagiotropic—(Stems or branches) Lateral, spreading.

Stamen—The pollen-bearing male organ of the flower.

Staminate—Having stamens only.

Unisexual—Of one sex, either male or female.

TAXUS COLLECTION
IN THE SECREST ARBORETUM, 1976

Name	Plot and Location
Taxus baccata 'Adpressa'	11-A, C
Taxus baccata 'Aurea'	1-D, 2-B
Taxus baccata 'Compacta'	21-E
Taxus baccata 'Dovastoniana'	20-C
Taxus baccata 'Erecta'	10-A, D
Taxus baccata 'Expansa'	39-A, C
Taxus baccata 'Fastigiata Aurea'	Old Collection, B1-96*
Taxus baccata 'Glauca'	19-A, D
Taxus baccata 'Michelii'	12-B, D, E
Taxus baccata 'Nigra'	25-D, 66-A
Taxus baccata 'Overeynderi'	58-B
Taxus baccata 'Repandens'	3-C, D, E
Taxus baccata 'Washingtonii'	Old Collection, B1-97*
Taxus canadensis	96-E
Taxus canadensis 'Dwarf Hedge'	87-A
Taxus cuspidata	7-B, 9-B
Taxus cuspidata 'Adams'	36-B, 73-B, D
Taxus cuspidata 'Aristocrat'	56-A
Taxus cuspidata 'Aurescens'	39-D
Taxus cuspidata 'Capitata'	15-A
Taxus cuspidata 'Densa'	18-C, E
Taxus cuspidata 'Expansa'	22-A
Taxus cuspidata 'Hiti'	61-B
Taxus cuspidata 'Intermedia'	51-C
Taxus cuspidata 'Midget'	35-D
Taxus cuspidata 'Nana'	8-C, D, 24-A, C
Taxus cuspidata 'Prostrata'	14-C
Taxus cuspidata 'Robusta'	5-E
Taxus cuspidata 'Sieboldii'	9-E
Taxus cuspidata 'Thayerae'	17-C, 52-D
Taxus hunnewelliana	88-A, C, E
Taxus hunnewelliana 'Globosa'	85-B
Taxus media	59-A, C, 91-B, D
Taxus media 'Amherst'	101-A, E
Taxus media 'Andorra'	16-D
Taxus media 'Anthony Wayne'	55-A
Taxus media 'Berryhill'	90-A, E
Taxus media 'Brevicata'	76-C
Taxus media 'Broad Beauty'	54-B, C, D, E
Taxus media 'Brownii'	57-B, 94-D
Taxus media 'Brownhelm'	103-A, E
Taxus media 'Burr'	28-A, B, D, E
Taxus media 'Chadwick'	102-B, D
Taxus media 'Coleana'	23-A, C, E
Taxus media 'Cole Type B'	53-B
Taxus media 'Compacta'	78-A, C
Taxus media 'Costich'	67-D
Taxus media 'Densiformis'	97-B, D, E
Taxus media 'Donewell'	18-D
Taxus media 'Drulia'	99-D, E
Taxus media 'Dutweilleri'	75-D
Taxus media 'Emerald'	105-A, B, E, 111-A, B, 112-B
Taxus media 'Everlow'	115-A, 116-A, B, 117-A, B
Taxus media 'Fairview'	20-A
Taxus media 'Flemer'	27-A, C, E
Taxus media 'Flushing'	123-A, C, D, E
Taxus media 'Grandifolia'	126-A, B, C, D
Taxus media 'Green Candle'	100-B, D
Taxus media 'Green Mountain'	81-B, E
Taxus media 'Halloriana'	49-A, D
Taxus media 'Hatfieldii'	48-E, 54-A, 63-B, 64-A, 98-A, C
Taxus media 'Hatfield No. 2'	95-C
Taxus media 'Hatfield No. 6'	80-A
Taxus media 'Hatfield No. 18'	69-C
Taxus media 'Hatfield No. 19'	95-A
Taxus media 'Hatfield No. 23'	46-C
Taxus media 'Henryi'	107-A, C, E
Taxus media 'Hicksii'	37-A, D, 50-B
Taxus media 'Hill'	45-B, D
Taxus media 'Hoogendoorn'	21-A
Taxus media 'Kelseyi'	5-B, 65-D, 68-B
Taxus media 'Kobel'	109-A, 110-B
Taxus media 'L. C. Bobbink'	38-B, C, D, E, 47-B
Taxus media 'Lodi'	62-A, C
Taxus media 'Mitiska Upright'	106-A, B, C, D
Taxus media 'Moon'	89-B
Taxus media 'Natorp'	30-B, D
Taxus media 'Newport'	32-B, 41-C, 108-B, C, E
Taxus media 'Ohio Globe'	104-B, D
Taxus media 'Peterson'	113-B, 114-A
Taxus media 'Pilaris'	120-B, C, D, E
Taxus media 'Pyramidalis'	124-A, B, C, D, E
Taxus media 'Robusta'	125-A, B, C, D, E
Taxus media 'Roseco'	118-A, C, E
Taxus media 'Runyan'	83-D
Taxus media 'Sebian'	43-A, E
Taxus media 'Sentinalis'	122-A, B, C, D, E
Taxus media 'Stovekenii'	33-A, C
Taxus media 'Stricta'	121-B, C, D, E
Taxus media 'Totem'	70-B
Taxus media 'Vermeulen'	64-C, 80-D
Taxus media 'Viridis'	119-B, C, D, E
Taxus media 'Wardii'	41-A, 46-A, 72-B, D
Taxus media 'Wellesleyana'	82-A, C
Taxus media 'Wilsonii'	71-A, C

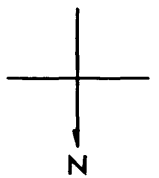
*Plot locations indicated in Finding List and Guide to the Secrest Arboretum, Spec. Circ. 91 (rev.), Ohio Agri. Res. and Dev. Center, Wooster, Dec. 1970.

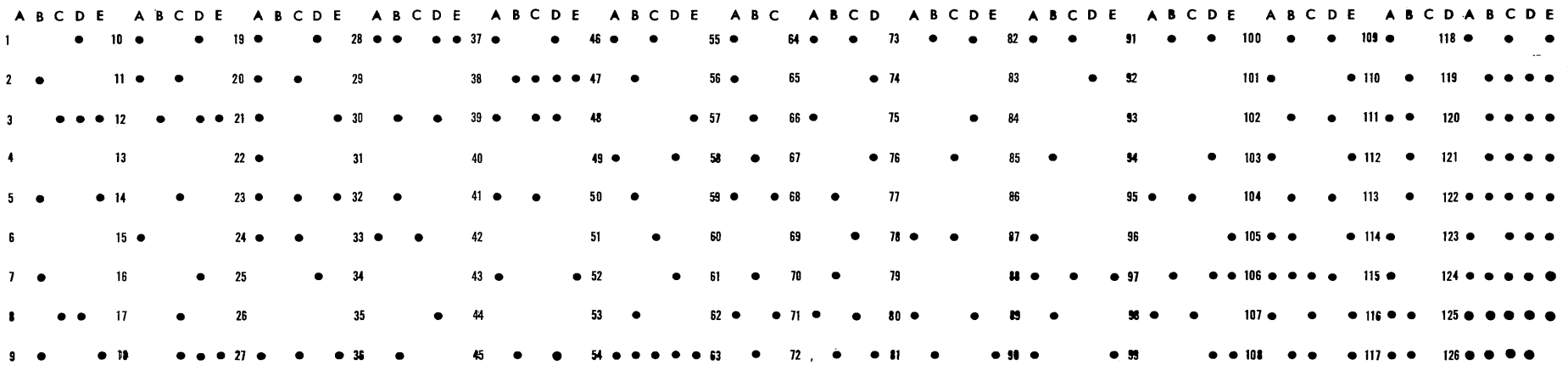
TAXUS COLLECTION
IN THE SECREST ARBORETUM, 1976

Plot	Location	Name
1	D	*Taxus baccata* 'Aurea'
2	B	*Taxus baccata* 'Aurea'
3	C D E	*Taxus baccata* 'Repandens'
4		
5	B	*Taxus media* 'Kelseyi'
5	E	*Taxus cuspidata* 'Robusta'
6		
7	B	*Taxus cuspidata*
8	C D	*Taxus cuspidata* 'Nana'
9	B	*Taxus cuspidata*
9	E	*Taxus cuspidata* 'Sieboldii'
10	A D	*Taxus baccata* 'Erecta'
11	A C	*Taxus baccata* 'Adpressa'
12	B D E	*Taxus baccata* 'Michelii'
13		
14	C	*Taxus cuspidata* 'Prostrata'
15	A	*Taxus cuspidata* 'Capitata'
16	D	*Taxus media* 'Andorra'
17	C	*Taxus cuspidata* 'Thayerae'
18	C E	*Taxus cuspidata* 'Densa'
18	D	*Taxus media* 'Donewell'
19	A D	*Taxus baccata* 'Glauca'
20	A	*Taxus media* 'Fairview'
20	C	*Taxus baccata* 'Dovastoniana'
21	A	*Taxus media* 'Hoogendoorn'
21	E	*Taxus baccata* 'Compacta'
22	A	*Taxus cuspidata* 'Expansa'
23	A C E	*Taxus media* 'Coleana'
24	A C	*Taxus cuspidata* 'Nana'
25	D	*Taxus baccata* 'Nigra'
26		
27	A C E	*Taxus media* 'Flemer'
28	A B D E	*Taxus media* 'Burr'
29		
30	B D	*Taxus media* 'Natorp'
31		
32	B	*Taxus media* 'Newport'
33	A C	*Taxus media* 'Stovekenii'
34		
35	D	*Taxus cuspidata* 'Midget'
36	B	*Taxus cuspidata* 'Adams'
37	A D	*Taxus media* 'Hicksii'
38	B C D E	*Taxus media* 'L. C. Bobbink'
39	A C	*Taxus baccata* 'Expansa'
39	D	*Taxus cuspidata* 'Aurescens'
40		
41	A	*Taxus media* 'Wardii'
41	C	*Taxus media* 'Newport'
42		
43	A E	*Taxus media* 'Sebian'
44		
45	B D	*Taxus media* 'Hill'
46	A	*Taxus media* 'Wardii'
46	C	*Taxus media* 'Hatfield No. 23'
47	B	*Taxus media* 'L. C. Bobbink'
48	E	*Taxus media* 'Hatfieldii'
49	A D	*Taxus media* 'Halloriana'
50	B	*Taxus media* 'Hicksii'
51	C	*Taxus cuspidata* 'Intermedia'
52	D	*Taxus cuspidata* 'Thayerae'
53	B	*Taxus media* 'Cole Type B'
54	A	*Taxus media* 'Hatfieldii'
54	B C D E	*Taxus media* 'Broad Beauty'
55	A	*Taxus media* 'Anthony Wayne'
56	A	*Taxus cuspidata* 'Aristocrat'
57	B	*Taxus media* 'Brownii'
58	B	*Taxus baccata* 'Overeynderi'
59	A C	*Taxus media*
60		
61	B	*Taxus cuspidata* 'Hiti'
62	A C	*Taxus media* 'Lodi'
63	B	*Taxus media* 'Hatfieldii'
64	A	*Taxus media* 'Hatfieldii'
64	C	*Taxus media* 'Vermeulen'
65	D	*Taxus media* 'Kelseyi'
66	A	*Taxus baccata* 'Nigra'
67	D	*Taxus media* 'Costich'
68	B	*Taxus media* 'Kelseyi'
69	C	*Taxus media* 'Hatfield No. 18'
70	B	*Taxus media* 'Totem'
71	A C	*Taxus media* 'Wilsonii'
72	B D	*Taxus media* 'Wardii'
73	B D	*Taxus cuspidata* 'Adams'
74		
75	D	*Taxus media* 'Dutweilleri'
76	C	*Taxus media* 'Brevicata'
77		
78	A C	*Taxus media* 'Compacta'
79		
80	A	*Taxus media* 'Hatfield No. 6'
80	D	*Taxus media* 'Vermeulen'
81	B E	*Taxus media* 'Green Mountain'
82	A C	*Taxus media* 'Wellesleyana'
83	D	*Taxus media* 'Runyan'
84		
85	B	*Taxus hunnewelliana* 'Globosa'
86		
87	A	*Taxus canadensis* 'Dwarf Hedge'
88	A C E	*Taxus hunnewelliana*
89	B	*Taxus media* 'Moon'
90	A E	*Taxus media* 'Berryhill'
91	B D	*Taxus media*
92		
93		
94	D	*Taxus media* 'Brownii'
95	A	*Taxus media* 'Hatfield No. 19'
95	C	*Taxus media* 'Hatfield No. 2'
96	E	*Taxus canadensis*
97	B D E	*Taxus media* 'Densiformis'
98	A C	*Taxus media* 'Hatfieldii'
99	D E	*Taxus media* 'Drulia'
100	B D	*Taxus media* 'Green Candle'
101	A E	*Taxus media* 'Amherst'
102	B D	*Taxus media* 'Chadwick'
103	A E	*Taxus media* 'Brownhelm'
104	B D	*Taxus media* 'Ohio Globe'
105	A B E	*Taxus media* 'Emerald'
106	A B C D	*Taxus media* 'Mitiska Upright'
107	A C E	*Taxus media* 'Henryi'
108	B C E	*Taxus media* 'Newport'
109	A	*Taxus media* 'Kobel'
110	B	*Taxus media* 'Kobel'
111	A B	*Taxus media* 'Emerald'
112	B	*Taxus media* 'Emerald'
113	B	*Taxus media* 'Peterson'
114	A	*Taxus media* 'Peterson'
115	A	*Taxus media* 'Everlow'
116	A B	*Taxus media* 'Everlow'
117	A B	*Taxus media* 'Everlow'
118	A C E	*Taxus media* 'Roseco'
119	B C D E	*Taxus media* 'Viridis'
120	B C D E	*Taxus media* 'Pilaris'
121	B C D E	*Taxus media* 'Stricta'
122	A B C D E	*Taxus media* 'Sentinalis'
123	A C D E	*Taxus media* 'Flushing'
124	A B C D E	*Taxus media* 'Pyramidalis'
125	A B C D E	*Taxus media* 'Robusta'
126	A B C D	*Taxus media* 'Grandifolia'
		Old Collection
B1*	96	*Taxus baccata* 'Fastigiata Aurea'
B1*	97	*Taxus baccata* 'Washingtonii'

*Plot locations indicated in Finding List and Guide to the Secrest Arboretum, Spec. Circ. 91 (rev.), Ohio Agri. Res. and Dev. Center, Wooster, Dec. 1970.

Taxus Collection - Secrest Arboretum





The State Is the Campus for Agricultural Research and Development

Ohio's major soil types and climatic conditions are represented at the Research Center's 13 locations.

Research is conducted by 15 departments on more than 7200 acres at Center headquarters in Wooster, eight branches, Green Springs Crops Research Unit, Pomerene Forest Laboratory, North Appalachian Experimental Watershed, and The Ohio State University.

Center Headquarters, Wooster, Wayne County: 1953 acres

Eastern Ohio Resource Development Center, Caldwell, Noble County: 2053 acres

Green Springs Crops Research Unit, Green Springs, Sandusky County: 26 acres

Jackson Branch, Jackson, Jackson County: 344 acres

Mahoning County Farm, Canfield: 275 acres

Muck Crops Branch, Willard, Huron County: 15 acres

North Appalachian Experimental Watershed, Coshocton, Coshocton County: 1047 acres (Cooperative with Agricultural Research Service, U. S. Dept. of Agriculture)

North Central Branch, Vickery, Erie County: 335 acres

Northwestern Branch, Hoytville, Wood County: 247 acres

Pomerene Forest Laboratory, Coshocton County: 227 acres

Southern Branch, Ripley, Brown County: 275 acres

Western Branch, South Charleston, Clark County: 428 acres